2005

Coaches' encouragement of imagery use by athletes.

Nathan D. Hall
University of Windsor

Coaches' Encouragement of Imagery Use by Athletes

By

Nathan D. Hall

A Thesis
Submitted to the Faculty of Graduate Studies and Research
through the Faculty of Human Kinetics
in Partial Fulfillment of the Requirements for
the Degree of Master of Human Kinetics at the
University of Windsor

Windsor, Ontario, Canada
2005

Your file Votre référence
ISBN: 0-494-04967-7
Our file Notre référence
ISBN: 0-494-04967-7

ABSTRACT

Imagery use in sport has been increasingly researched over the past few decades. Despite the recognition that athletes can benefit from employing imagery, there has been limited research investigating factors (e.g., sport type, competitive level) that influence athletes' use of imagery. One factor that has recently received some limited attention has been coaches' influence on athletes' imagery use (Munroe, Hall, Simms, & Weinberg, 1998). Research has suggested that coaches support the use of many psychological techniques (e.g., goal setting, imagery, team building), and they believe imagery is the most useful. Therefore, they employ it most frequently with their athletes (Hall & Rodgers, 1989). A recent study by Jedlic (2003) examined athletes' perceptions of coaches' encouragement of imagery use. The results suggested that coaches do have a significant influence on athletes' imagery use. This study, however, only investigated athletes' perceptions of the extent to which coaches encouraged imagery use. It is possible that athletes and coaches differ with respect to the perceived encouraged imagery use. The present study examined coaches' encouragement of athletes' use of mental imagery. Various demographic characteristics, which may affect coaches' encouragement of athletes' imagery use (i.e., gender, age, National Coaching Certification Program level, level of athlete coached) were also examined. The participants included 215 coaches from 27 different sports, who varied in age, gender (male n=139, female n=76), National Coaching Certification Program (NCCP) level, and the competitive level of the athletes they were presently coaching. All participants completed the 47 item Coaches' Encouragement of Imagery Use by Athletes Questionnaire, which was designed to investigate coaches' encouragement of imagery

use based on Munroe, Giacobbi, Hall, and Weinberg's (2000) four W's (Where, When, Why, and What) of imagery use. Results revealed that coaches encouraged their athletes to use imagery, especially in conjunction with competition and for motivational general-mastery purposes (i.e., mental toughness, focus, confidence, and positivism). Furthermore, the level of athlete coached and to a lesser extent coaches' NCCP level influenced their encouragement of imagery use. Specifically, coaches of national/international level athletes encouraged their athletes to use imagery significantly more than coaches of recreational level athletes. Coaches with NCCP levels 2-5 differed significantly from their level 1 counterparts by encouraging their athletes to use more cognitive general-imagery (i.e. images related to game plans and strategies). Coaches' gender was not found to influence athletes' imagery use. The findings from this study suggest that all coaches (especially those of recreational athletes) need to increase the frequency with which they encourage imagery use. It is vital that coaches of all levels understand their influence is not limited to development of athletes' physical skills, but is also a major factor affecting athletes' psychological skills. By encouraging their athletes to use imagery, coaches are providing their athletes with the best possible tools for success.

ACKNOWLEDGEMENTS

I would first like to acknowledge and thank my advisor Dr. Krista Chandler for her valuable help and support throughout my Masters studies. This could not have been accomplished without your assistance. Thank you for all that you have done to help make this a successful venture. Your guidance has been greatly appreciated.

I would also like to thank all the members of my thesis committee. Dr. Kim Gammage, Dr. Dennis Jackson, and Dr. Jen Jakobi who advised and challenged me to create a thesis that I can be extremely proud of. Furthermore, I would like to acknowledge my dad Dr. Craig Hall, Sarah Wilson, Liam McGrath, Ian Reade, Dr. Kevin Spink, Chris Adkins, Dr. Volker Nolte, and all the other people who assisted me in my data collection. Without your assistance I would never have met my lofty goal of 200 plus coaches.

Finally, I would like to thank my family and friends for their support. love and encouragement throughout my Masters studies. I would especially like to thank my girlfriend Sarah for always being there for me and keeping me smiling, as well as, my mom for her never ceasing confidence in me. Last but certainly not least, I would like to thank and acknowledge my dad. Your support, guidance, and car were always there when I needed them. You are one of my greatest inspirations and also one of my best friends. Thank you for everything.

TABLE OF CONTENTS

ABSTRACT iii
ACKNOWLEDGEMENTS v
LIST OF TABLES viii

CHAPTER

I. INTRODUCTION 1

II. LITERATURE REVIEW
Coaches' Beliefs About Psychological Skills and their Influence on Athletes 2
Imagery Defined and Imagery Use 5
Variables Influencing Athletes' Imagery Use 8
Coaches' Encouragement of Imagery Use 11
Purpose of the Present Study 13
Hypotheses 14

III. METHOD
Participants 15
Instruments 17
The Coaches' Encouragement of Imagery Use by Athletes Questionnaire (CEIUAQ) 17
Procedures 19
Data Analyses 20

IV. RESULTS 22
Preliminary Analyses 22
Where and when coaches encourage imagery use 22
Why coaches encouraged imagery use 22
What coaches encourage their athletes to image 24
Internal consistency of Part C of the CEIUAQ 24
Correlations 25
Frequency Analyses 25
Coaches' Gender 30
Coaches' NCCP Level 32
Level of Athlete Presently Coached 39

V. DISCUSSION 44
Where Coaches Encourage Imagery Use 45
When Coaches Encourage Imagery Use 46
Why Coaches Encourage Imagery Use 46
What Coaches Encourage Their Athletes to Image 48

Coaches' Age and Gender 50
Coaches' NCCP Level 51
Level of Athlete Presently Coached 53
Limitations 56
Future Directions 57
Practical Implications 58
Conclusion 60

REFERENCES 62

APPENDICES
(A) Coaches' Encouragement of Imagery Use by Athletes Questionnaire 68
(B) 4 W's of Imagery Use (Munroe et al. 2000) 73
(C) Letter of Information 75
(D) Consent Form 78

VITA AUCTORIS 81

LIST OF TABLES

TABLE

1. Number of coaches per sport 16

2. Means and standard deviations for imagery use for all items on the CEIUAQ 23

3. Number of male and female coaches by NCCP level 27

4. Number of male and female coaches by level of athlete presently coached 28

5. Coaches' NCCP level by level of athlete presently coached 29

6. Means and standard deviations for imagery use based on coaches' gender 31

7. Means and standard deviations for imagery use based on coaches' NCCP level 34

8. Means and standard deviations for imagery use based on reporting of NCCP level 36

9. Univariate statistical results and observed power for reporting of NCCP level 37

10. Means and standard deviations for imagery use based on level of athlete presently coached 40

11. Univariate statistical results for level of athlete presently coached 41

Introduction

Coaches often encourage their athletes to utilize various mental training strategies such as goal setting, self-talk, focusing, relaxation, and imagery (Hall & Rodgers, 1989; National Coaching Certification Program (NCCP, 1994). Coaches believe these techniques will help their athletes perform better and give them a competitive edge. Their beliefs appear to be justified. Over the past few decades, there has been an increasing amount of literature regarding the use of psychological techniques by athletes and the many benefits that can come from their use (e.g., Burton, Weinberg, Yukelson, & Weigand, 1998; Hall, 2001; Hardy, Gammage, & Hall, 2001; Munroe-Chandler, Hall, & Weinberg, 2004). Despite the recognition that athletes can benefit from using psychological techniques, there has been limited research investigating factors (e.g., type of activity, time of competitive season, and competitive level) that influence athletes' use of these techniques. Another factor that seems to be important is the amount of encouragement athletes receive from their coaches with respect to the use of these techniques (Munroe, Hall, Simms, & Weinberg, 1998).

Hall and Rodgers (1989) asked figure skating coaches about their use of imagery, task focusing, competitive strategies, cue words, and relaxation with their skaters. The coaches reported employing all these techniques relatively often (i.e., all techniques rated over 5 on a scale with 1 = never and 7 = always) with their skaters and rated them all as quite helpful (i.e., all techniques rated over 6 on a scale with 1 = not effective and 7 = very effective). However, imagery was used the most frequently and considered the most useful. In another study with rowers, Barr and Hall (1992) found that about one third of the athletes examined reported their coaches encouraged the use of imagery. Based on

these few studies, it seems coaches believe imagery is a valuable psychological technique for athletes to employ and therefore encourage its use. The present study examined the extent to which coaches encourage their athletes to use imagery.

Literature Review

Coaches' Beliefs About Psychological Skills and their Influence on Athletes

While there is a variety of print material available on coaching (e.g., Lynch, 2001; Martens, 2004), there has been very little scientific research investigating coaches' encouragement of psychological skills by their athletes. Areas that have received some consideration are goal setting, team building, and coaches' beliefs in psychological skills. Weinberg, Butt, and Knight (2001) recently examined coaches' encouragement of goal setting. Their study provided qualitative data in regards to the goal setting practices of coaches across a variety of sports and of differing levels of experience. Three general areas were investigated in this study: team goals, individual athlete goals, and personal coaching goals. Results from Weinberg and colleagues' study revealed that coaches employed goal setting extensively for both team and individual goals in practice and competition. Furthermore, the results suggested that most coaches tend to set both long- and short-term goals. Finally, this study also found that coaches both dictate goals to their athletes and set goals in collaboration with their athletes. These findings suggest that coaches of all levels and of both team and individual sports feel that goal setting is a useful strategy for their athletes to employ, and that encouragement of this psychological technique will be valuable to their athletes. These results also indicate that coaches want to be involved in the goal setting process either by fully controlling what goals are set or by working with the athletes to set goals.

Coaches have also reported using team-building strategies with their athletes. A study by Bloom, Stevens, and Wickwire (2003) qualitatively investigated expert coaches' perceptions of team building. Findings from the focus groups conducted for this study suggested that expert coaches understood, believed in, and implemented team-building activities. Also, the study indicated that expert coaches saw team building as a season-long process utilized to improve team cohesion. As with goal setting, this would suggest that coaches encourage the use of team building and believe in its benefits. Furthermore. Bloom et al. reported that coaches wanted to have control over team building activities, although they did not want to be seen as the person who dictated all the activities. They would prefer to teach their ideas to team leaders who would then dictate the activities to the rest of the team (indirect method). This finding suggests that coaches believe they should encourage team building and have a role in its development; however, they want it implemented by the athletes themselves.

One other area of research that is closely related to those discussed above is the examination of coaches' beliefs in psychological skills as an effective aid for their athletes. Gould, Guinan, Greenleaf, and Chung (2002) completed an investigation on what coaches perceived were important variables influencing athletes' effective performance at the Olympics. It was found that coaches of Olympic athletes perceived that a variety of variables influenced effective performance. These included psychological skills such as plans for and dealing with distractions, retaining high levels of athlete confidence, and team cohesion. This suggests that high-level coaches believe psychological skills are contributing factors to effective athlete performance at the Olympic Games. Furthermore, results from this study suggested that coaches believed

that participation in team building a year or more before the Olympic Games had an impact on effective athlete performance at the games. Hence, one could assume coaches from this study not only believed that encouragement and application of psychological skills during Olympic competition increased effective performance of athletes, but that using these skills in preparation for the Olympics increased effective athlete performance at the games.

All of these studies suggest that coaches have a strong belief in the use of various psychological skills by their athletes, and encourage such use. The Coaching Association of Canada has developed the National Coaching Certification Program (NCCP) in which various psychological skills are discussed and promoted including goal setting, relaxation, team building, concentration, imagery, and the development of pre-competition and competition strategies (see NCCP, 1994). Howe (1996) investigated whether high-level coaches actually implement these NCCP psychological skills and concluded that; a) the understanding of the need to integrate psychological skills within regular practices is well accepted by coaches, and b) coaches see themselves as able to present psychological skills as part of the normal training experiences of their athletes. It is worth emphasizing again, however, that these psychological skills have received little empirical investigation. Except for the research on goal setting and team building previously discussed, the only other psychological skill that has received some examination is imagery (e.g., Moritz, Hall, Martin, & Vadocz, 1996). Given that coaches' encouragement of imagery was the focus of the present study, this variable is considered in some detail in the following sections.

Imagery Defined and Imagery Use

Mental imagery has been defined as a psychological activity that involves re-creating the physical properties of a person, object, or skill that is out of personal perception (Denis, 1985). Furthermore, the re-creation can involve any sense or modality (e.g., visual, kinesthetic, auditory). More recently White and Hardy (1998) comprehensively defined imagery as an experience that imitates a real experience, and that we can be conscious of 'seeing' an image of smell, tastes, or sounds without actually experiencing the real thing. Furthermore, White and Hardy suggested that an image differs from a dream in the sense that we are awake and conscious when we create an image.

Imagery has received considerable attention in the motor skill and sport psychology literature over the years (e.g., Blair, Hall, & Leyshon, 1993; Denis, 1985; Feltz & Landers, 1983; McBride & Rothstein, 1979; Start & Richardson, 1964). Most of these studies investigated how imagery helps athletes acquire motor skills. More recently, Munroe, Giacobbi, Hall, and Weinberg (2000) qualitatively examined four fundamental questions of imagery: *Where* is imagery used? *When* is imagery used? *Why* is imagery used? and *What* is being imagined? They referred to these four questions as the "four W's of imagery use".

In regards to where athletes use imagery, the two most common places are in practice or competition (Hall, 2001). Studies have also found that athletes report using imagery outside of practice and competition (Salmon, Hall, & Haslam, 1994). Salmon and colleagues found that athletes report the use of imagery at work, home, and school. Overall, studies have indicated that athletes utilize imagery in conjunction with

competition the most, and to a lesser extent in conjunction with practice (Hall, Rodgers, & Barr, 1990; Salmon et al., 1994). This would suggest athletes are using imagery more as a means to enhance performance and create more effective skill execution than for the purposes of developing or learning a skill.

There are many different times when an athlete can utilize imagery. Overall, athletes have been found to make the most substantial use of imagery immediately prior to competition, to a lesser extent during competition, and the least immediately following competition (Hall et al., 1990; Munroe et al., 1998). As for practice, Salmon et al. (1994) found that athletes use it more during practice than before or after practice. In addition to competition and practice, athletes also have been found to use imagery during breaks in daily activities and especially at night immediately prior to sleeping (Hall et al., 1990; Rodgers, Hall, & Buckolz, 1991). Furthermore, research has also suggested that athletes should use imagery when they are recovering from injury (Green, 1992).

Why athletes use imagery can be attributed to two basic functions. Paivio (1985) proposed a basic analytical framework to explain how these functions operate. He suggested that imagery serves a cognitive and a motivational function and each one operates either at a specific or a general level. The cognitive-specific (CS) function of imagery involves the rehearsal of sport specific skills and is an effective adjunct to physical practice. It has also been found to be a possible alternate or replacement (i.e., can be used without adversely affecting learning or performance) for some physical practice (Durand, Hall, & Haslam, 1997). Therefore, it can be useful when physical practice cannot be completed (e.g., because of injury, lack of facility). The CS function of

imagery was the most studied function in the early stages of research into athletes' use of imagery (see Feltz & Landers, 1983 for a review).

The cognitive-general (CG) function of imagery involves the imagery of game plans, strategies of play, and routines. Research into this function of imagery has been relatively limited. It has been reported that athletes use CG imagery for the same basic reasons they employ CS imagery (Munroe et al., 2000). More specifically, athletes employ CG imagery as a means of developing and carrying out game plans, creating strategies of play, and creating and rehearsing routines.

The motivational specific (MS) function of imagery involves imagining particular goals and the activities that must be completed for the realization of those goals. Munroe et al. (2000) suggested there are two types of goals for which athletes are using MS imagery; outcome goals and performance goals. Outcome goals are further divided into individual and team goals, and they involve imaging winning and other such accomplishments (e.g., winning a gold medal). Performance goals, on the other hand, are those that involve imaging what it takes to achieve a goal (e.g., imagine training hard). It has been argued that athletes will benefit from the use of MS imagery in both training and competition as it may increase their motivation to achieve goals (Callow, Hardy, & Hall, 2001).

The final function of imagery is motivational general (MG). This function of imagery is associated with physiological arousal and affect. Hall, Mack, Pavio, and Hausenblas (1998) further subdivided MG into two components: arousal (MG-A) and mastery (MG-M). MG-A imagery is related to the regulation of arousal and stress levels, while MG-M imagery is associated with mental toughness, focus, confidence, and

positivism (Munroe et al., 2000). Both of the MG components of imagery have received attention in recent research on athletes' use of mental imagery (see Hall, 2001 for a review), and it has been suggested that MG-A imagery accounts for significant variance in self-reported levels of competitive anxiety (Vadocz, Hall, & Moritz, 1997). Furthermore, research on MG-M has indicated that athletes use it more than any other function of imagery and that it is especially effective for enhancing performance in competitions (Munroe et al., 1998).

Munroe and colleagues' (2000) final "W" is based on the question "what do athletes imagine?" The content of athletes' images has been investigated from many different approaches (see Hall, 2001 for a review). Munroe and colleagues completed one of the most exhaustive investigations into athletes' imagery content and proposed the following five imagery content categories based on their findings: sessions (i.e., the length of time and frequency of athletes' imagery sessions); effectiveness (facilitative or debilitative); surroundings (i.e., environment, other competitors); nature (e.g., positive vs. negative); and type (e.g., visual, kinesthetic, auditory, olfactory, and speed). Imagery content has also been considered in regards to the visual perspective (internal or external) athletes employ. Research has argued that task differences can have an influence on which visual perspective an athlete decides to utilize (Hardy, 1997). Research by Hardy has suggested that when learning skills for a sport that depends greatly on form (e.g., gymnastics) an external visual perspective is better than an internal visual perspective.

Variables Influencing Athletes' Imagery Use

Although many studies have documented the positive effects that imagery can have on motor performance (e.g., Feltz & Landers, 1983; Murphy, 1994), it is important

to gain an understanding of the variables that influence the effectiveness of imagery use. Hall et al. (1990) suggested that even though many athletes extensively utilize imagery, they do not always use it as effectively as possible and therefore do not receive the maximal performance benefits. Some of the variables that may have an influence on effective imagery use include imagery ability, type of activity, competitive level, and time of season.

Many athletes report utilizing imagery, but not all of them have the same ability to do so. Studies have demonstrated that a relationship exists between imagery ability and motor performance (Goss, Hall, Buckolz, & Fishburne, 1986; Hall, Buckolz, & Fishburne, 1989). More specifically, these studies indicated that individuals with high imagery ability learned movements more quickly and performed movements more accurately than individuals with lower imagery ability. Furthermore, research by Rodgers et al. (1991) found that not only is imagery an ability, but it is also a skill that can be improved through regular, deliberate practice.

Not surprisingly, type of activity has also been found to affect athletes' use of imagery (Munroe et al., 1998). One obvious reason for this is that imagery content can be much different from one activity to another. For example, the imagery content of a track athlete will involve the skills needed to perform successfully in that sport, including starts, running technique, and pace; in contrast, a volleyball player will image serves, passes, sets, hits, and team plays. Another apparent difference offered by Hall (2001) is the opportunity for imagery to occur. When competing in continuous tasks such as speed skating and running, there is less opportunity to image, whereas in discrete tasks such as diving and golf a participant can image a skill before each attempt. Also, it has been

found that the ease with which a task can be imagined influences imagery use (Hall, Schmidt, Durand, & Buckolz, 1994). The easier a skill, the more likely imagery will be employed as a technique to learn the skill. Finally, Munroe et al. (1998) completed an extensive study of athletes from 10 different sports, and their results indicated that the five functions of imagery (CS, CG, MS, MG-A, and MG-M) were utilized to different extents in the various sports.

Competitive level is another variable that has received a great deal of interest in imagery research. Research by Blair et al. (1993) found that skill improvement is equal when both elite (varsity soccer players) and novice level (beginner soccer players) competitors use CS imagery to practice the same novel task for the same amount of time. This suggests that athletes of all skill levels can benefit from using CS imagery when learning a new task. With respect to whether elite or novice athletes use more imagery, studies employing the Imagery Use Questionnaire (IUQ; Hall et al., 1990) have consistently found that athletes of all skill levels utilize imagery but the higher the skill level of the athlete, the greater the amount of imagery used (Barr & Hall, 1992; Hall et al., 1990).

The last variable that has been found to affect athlete imagery use is time of competitive season. Since it has been demonstrated that athletes tend to use imagery more for competition than training, it follows that athletes' use of imagery may change over the course of the season depending on the timing of major competitions. Munroe et al. (1998) found that athletes from a variety of sports generally indicated an increased use of all five functions of imagery (CS, CG, MS, MG-M and MG-A) as the competitive season progressed, although the nature of the increase was dependent on the sport. Furthermore,

Cumming and Hall (2002) found that all levels of athletes reported using imagery significantly less during the off-season compared to other parts of the competitive year.

In addition to imagery ability, type of activity, competitive level, and time of season, there are likely other variables that influence athletes' use of imagery. One such variable that has been suggested in previous research (Munroe et al., 1998) and has recently come under consideration is the influence that coaches can have on athletes' imagery use.

Coaches' Encouragement of Imagery Use

Research undertaken by Hall and Rodgers (1989) was one of the first studies to investigate coaches' beliefs in and application of various psychological skills. In this study, coaches were instructed on the best ways to promote and teach imagery, focus, cue words, relaxation and competitive strategies to their athletes. This was done via coaching workshops. Questionnaires administered to the coaches concerning their use of these psychological skills with their athletes revealed that imagery was the psychological skill employed most often and also the psychological skill seen by coaches as the most useful. Furthermore, it was found that coaches who had a greater amount of coaching experience perceived imagery to be a more useful skill than their less experienced counterparts.

Although the above study indicated coaches have a belief in the benefits that can be attained through the use of imagery by their athletes, it does not indicate to what extent the coaches are actually promoting imagery use. To remedy this situation, Jedlic (2003) recently asked athletes how much their coaches encourage the use of imagery. To accomplish this, Jedlic developed the Coaches' Influence on Athletes' Use of Imagery Questionnaire (CIAUIQ) based on the 4 Ws of imagery use (Munroe et al., 2000). The

questionnaire was administered to 317 athletes from several different sports and of varying competitive levels. Athletes were required to answer the items on the questionnaire based on their perceptions of the influence provided only by their present coach. Jedlic found that most athletes, except at the recreational level, suggested their coaches provided considerable encouragement with respect to using imagery. This finding would seem to agree with the results reported by Hall and Rodgers (1989), and would seem to confirm that coaches of higher levels and with more experience are more likely to encourage the use of imagery. Furthermore, Jedlic reported that coaches' gender had no influence on athletes' perceptions of coaches' encouragement of imagery. This lack of gender difference is supported in previous imagery research (c.f. Hall, 2001).

With respect to where and when coaches encourage their athletes to use imagery, Jedlic (2003) found athletes perceived their coaches to most often promote the use of imagery in conjunction with competition, especially just prior to competing. Once again, this would seem to coincide with previous literature as it has been consistently found that athletes employ imagery more in conjunction with competition than with practice (e.g., Barr & Hall, 1992; Hall et al., 1990; Munroe et al., 2000). Furthermore, Jedlic reported that while athletes perceived their coaches to encourage imagery less in conjunction with practice than competition, coaches provided the least encouragement when the athletes were injured. This finding was considered somewhat surprising due to the recent research that has indicated athletes can receive considerable benefits from utilizing imagery while injured (e.g., Sordini, Hall, & Forwell, 2000).

In regards to the functions (why) of imagery, Jedlic (2003) found athletes perceived their coaches to encourage MG-M imagery more than the other functions of

imagery. That is, their coaches specifically seemed to encourage imagery use as a means of increasing self-confidence and mental toughness, and as a way to remain focused and positive. Research has shown that athletes employ MG-M imagery more than any other function of imagery (Munroe et al., 2000) and the aforementioned finding could be part of the reasoning behind this.

Finally, with respect to what coaches are encouraging their athletes to image, Jedlic (2003) found coaches were perceived by their athletes to encourage the use of both internal and external perspectives, as well as both visual and kinesthetic imagery. Again, these findings coincide well with previous research on the content of athletes' imagery. Hall et al. (1990) reported that athletes from numerous sports use both kinesthetic and visual imagery, and that athletes use both internal and external perspectives, often switching back and forth between the two.

Purpose of the Present Study

While the research by Jedlic (2003) indicates that coaches provide considerable encouragement for their athletes to use imagery, only the athletes' perceptions of the extent to which coaches encouraged imagery use was assessed. This is a salient point as coaches' encouraged imagery use may differ from the athletes' perceptions of coaches' encouraged imagery use. Thus, the overall purpose of this study was to focus on coaches and how much they encourage imagery use by their athletes, thereby building upon Jedlic's (2003) original paper. More specifically, this study investigated the extent coaches' NCCP level, coaches' age, and coaches' gender, as well as athletes' competitive level affected the amount and type of encouraged imagery use a coach gave their athletes. To accomplish these purposes, coaches were administered a questionnaire designed to

investigate 'where' coaches encouraged their athletes to use imagery, 'when' they encouraged their athletes to use imagery, 'why' they encouraged their athletes to use imagery, and finally 'what' they encouraged their athletes to image.

Hypotheses

Based on Jedlic's (2003) findings and previous literature on imagery use, it was possible to make several general hypotheses regarding coaches' encouragement of imagery use based on the 4 W's of imagery (Munroe et al., 2000). It was hypothesized that coaches would encourage athletes' imagery use most in conjunction with competition, especially immediately prior to competing. Also, it was hypothesized that coaches would encourage MG-M imagery the most, as well as encourage both internal and external perspectives, and both visual and kinesthetic imagery (as suggested by Jedlic). Furthermore, it was hypothesized that coaches would encourage their athletes to use imagery on a regular basis, but would not encourage their athletes to plan imagery use sessions.

It was also possible to make a few specific hypotheses concerning how certain demographic characteristics of coaches may influence the amount of imagery encouragement they provide their athletes. First, it was hypothesized that higher NCCP level coaches would encourage their athletes to employ imagery use more than their lower level counterparts (Hall & Rodgers, 1989; Jedlic, 2003). Coaches with higher NCCP levels would be more likely to have been informed and prepared to teach mental skills to their athletes, such as imagery use. This is due to the fact that mental training is not specifically covered in the NCCP until level 3.

A second specific hypothesis based on Jedlic's (2003) findings was that coaches working with higher competitive level athletes (i.e., national and international) would encourage imagery more than coaches working with lower competitive level athletes (i.e., recreational and club). Coaches of lower competitive level athletes would be more likely to be concerned about training physically and expanding physical skills than teaching and promoting the use of mental skills (Jedlic, 2003).

Finally, it was hypothesized based on Jedlic's (2003) findings that coaches' age but not gender would influence the amount of encouraged imagery use given to their athletes. It was reasoned that older coaches were likely those dealing with athletes of a higher competitive level and thus encouraged more imagery use than younger coaches. A younger coach working with an athlete competing at a recreational level would be less likely than an older more experienced coach in trying to implement the use of mental skills. Furthermore, young coaches of athletes participating at a low competitive level may feel their athletes can receive greater benefits from physically practicing a skill in comparison to mentally training. Jedlic reported no differences based on coaches' gender. As such, it was reasoned that the present study would also find no gender differences.

Method

Participants

The participants were 215 male (n = 139) and female (n = 76) coaches (approximate return rate of 68%) ranging in age from 18 – 65 years from an array of sports, the most common being ice hockey (n = 41), basketball (n = 31), and volleyball (n = 31) (See Table 1). They coached athletes ranging in age from 2 – 65 years. The coaches

Table 1

Number of Coaches Per Sport

Sport	Number of Coaches
Ice Hockey	41
Basketball	31
Volleyball	31
Soccer	18
Figure Skating	14
Track and Field	13
Rowing	10
Swimming	9
Squash	7
Football	6
Rugby	6
Golf	4
Cross Country Running	3
Lacrosse	3
Softball	2
Gymnastics	2
Boccia	2
Wrestling	2
Baseball	2
Field Hockey	2
Tennis	2
Fencing	1
Horseback Riding	1
Speed Skating	1
Cheerleading	1
Diving	1
Total	215

also differed with respect to highest competitive level athlete they were currently coaching: recreational (n = 53), club (n = 59), provincial (n = 15), varsity (n = 54), national (n = 16), and international (n = 18). Coaches were considered "recreational" level coaches if they were currently only coaching athletes that engaged in the sport for purely extra-curricular reasons; "club" if the highest level of athlete they were currently coaching competed regionally within their sport; "provincial" if the highest level of athlete they were currently coaching competed provincially; "varsity" if the highest level of athlete they were currently coaching were on a university/college team: "national" if the highest level of athlete they were currently coaching were national competitors; and "international" if they were currently coaching athletes that were on a "National Team" and competed at international events (e.g., World Championships, Olympics).

The NCCP is composed of five levels. Coaches from all levels, as well as coaches that did not report an NCCP level were included in the study. There were 37 Level 1 coaches, 39 Level 2 coaches, 38 Level 3 coaches, 9 Level 4 coaches, 3 Level 5 coaches, and 89 coaches that did not report their NCCP level. Out of all 215 coaches in the study, only 15.8% (n = 34) reported having a sport psychologist working with their present athletes, but 81.4% (n = 185) reported using imagery when they personally competed as an athlete.

Instruments

The Coaches' Encouragement of Imagery Use by Athletes Questionnaire (CEIUAQ). The CIAUIQ was originally developed by Jedlic (2003) to evaluate athletes' perceptions of how their use of imagery was influenced by their present coach. It was designed from the 4 W's of imagery use proposed by Munroe et al. (2000) and previous

imagery measures including the Imagery Use Questionnaire (IUQ; Hall et al., 1990) and the Sport Imagery Questionnaire (SIQ; Hall et al., 1998). Initially, the CIAUIQ was reviewed by three sport psychology specialists, as well as by three coaches in the sport of rowing (1 varsity and 2 international). Minor changes were made to accommodate their feedback. Research has indicated that data collected from both the IUQ and the SIQ possess adequate psychometric properties (Hall et al., 1998). Jedlic (2003) also found the data from the section of the CIAUIQ based on the SIQ had acceptable internal consistencies (i.e., Cronbach's alphas > .70, Nunally, 1978).

For the proposed study, the CIAUIQ was revised by the author and an expert in the field of sport psychology in order to evaluate coaches' encouragement of imagery use by their present athletes. The revised questionnaire was termed the Coaches' Encouragement of Imagery Use by Athletes Questionnaire (CEIUAQ, see Appendix A). The stem used for the scale in the original CIAUIQ was changed from "My coach encourages me..." to "When in season I encourage my athletes...". Also, some of the items from the CIAUIQ were slightly reworded to suit the CEIUAQ, and a few items were moved from one part of the questionnaire to another so as to better reflect Munroe et al's. (2001) 4 W's (see Appendix B).

The CEIUAQ is comprised of four parts. In Part A of the questionnaire, the coaches were requested to provide demographic information concerning their gender, age, the sport they were presently coaching, the highest competitive level of athlete they were currently coaching, their number of years coaching at that level, the age of the athlete they were presently coaching, their NCCP level, whether or not a sport

psychology consultant worked with their present athletes, and whether they personally used imagery as an athlete.

The remaining three sections of the questionnaire were directed towards coaches' perceived influence on their athletes' use of imagery. A total of 47 items were utilized to compose these three sections. The items were intended to address the four W's of imagery use first proposed by Munroe et al. (2000). Ratings on the 47 items were made on a seven-point scale anchored by 1 (When in season, I rarely encourage my athletes to use imagery) and 7 (When in season, I often encourage my athletes to use imagery). Part B of the questionnaire considered "Where" (e.g., practice, at home, in conjunction with competition, and while injured) and "When" (e.g., pre-competition, post competition, and just before going to bed) coaches promoted imagery use. Part C examined "Why" coaches encouraged their athletes to use imagery. Thus, the items within Part C addressed the five functions of imagery use (CS, CG, MS, MG-A, and MG-M). Part D related to "What" coaches encouraged their athletes to image (i.e., imagery content such as length and frequency, effectiveness, nature, surroundings, and controllability of imagery sessions).

Procedures

A convenient sample of coaches from all NCCP levels and from a variety of sports were requested to take part in this study. Coaches were contacted inside and outside of the sporting environment either directly or through the use of electronic mail. Personal contacts and the resulting snowball effect were used as the method of finding possible participants. Prior to completing the study (which took approximately 15 minutes), the coaches were given a Letter of Information (see Appendix C) that explained

the nature of the study. It also informed the coaches that their participation was completely voluntary, and that the results of the study would remain confidential. Furthermore, they were informed they could freely withdraw from the study at any time and if they needed to ask any questions to contact the investigator. Once the participants had read the Letter of Information, they were asked to complete a consent form (see Appendix D) followed by the questionnaire. Participants currently coaching athletes of different competitive levels were requested to answer the questionnaire with respect to the highest level of athletes they were presently coaching. Coaches were informed that the researcher would be available to address any questions (in person or through electronic mail). Following the completion of the questionnaire, coaches returned them directly to the researcher in person or through the mail. At that time, coaches were thanked for their participation and informed that the general findings would be available upon request once the research was completed.

Data Analyses

Descriptive statistics were calculated for each item on Parts B and D of the CEIUAQ. Due to the fact that Part C of the CEIUAQ was comprised of the five subscales from the SIQ, the means and standard deviations for each subscale were calculated. To determine if differences existed for coaches' encouragement of imagery use, separate within subjects ANOVAs were conducted for the "where", "when", "what", and "why" (five subscales from Part C of the CEIUAQ). Greenhouse-Geisser significance tests were employed to control for any violations of sphericity. In addition, the internal consistency of the data from each subscale from Part C of the CEIUAQ (i.e., CS, CG, MS, MG-M,

and MG-A) was evaluated. This was done using Cronbach's alpha with the criterion level set at an alpha coefficient of .70 (Nunnally, 1978).

Correlations were calculated for coaches' age and all the items on the CEIUAQ, as well as for the number of years coaching at the present level and all the items on the CEIUAQ. In addition, the relationships among coaches' age, the number of years coaching at their current level, coaches' NCCP level, and the highest level of athlete presently coached were examined to determine whether or not all these variables were to be included in further analyses. Additionally, frequencies and Chi-square analyses were conducted to establish whether coaches' gender, NCCP level, and level of athlete presently coached were confounded.

Finally, MANOVAs were used to assess coaches' encouragement of imagery use. In separate analyses, coaches' gender, NCCP level, and level of athlete presently coached served as the independent variables. In each separate analysis, the dependent variables were the coaches' ratings on the items within the *CEIUAQ*, which address the four W's proposed by Munroe et al. (2000). For Part C of the questionnaire, the dependent variables were the subscale scores for the five functions of imagery (i.e., CS, CG, MS, MG-M, and MG-A). Pillai's Trace criterion was used as the multivariate statistic because it is robust to violations of the assumption of homogeneity of the variance covariance matrices. Furthermore, observed power which is the sensitivity of an experiment, was reported for all significant effects. If the power is relatively high in an experiment, the researcher is more willing to conclude that the alternative hypothesis is more likely to be true.

Results

Preliminary Analyses

Table 2 indicates the means and standard deviations for all of the items on the CEIUAQ.

Where and when coaches encourage imagery use. A within subjects ANOVA revealed a significant effect for where (i.e., place) coaches encouraged their athletes to use imagery, $F(3, 642) = 76.01, p < .001$. Further analysis using Tukey HSD post hoc tests indicated that all four situations were significantly different ($p < .01$) (See Table 2). In regards to when (i.e., time) coaches encouraged their athletes to use imagery, again a within subjects ANOVA proved significant, $F(2, 428) = 123.93, p < .001$. Tukey HSD post hoc tests revealed that coaches encouraged significantly more imagery use immediately prior to competing than post-competition or just before going to bed ($p < .001$).

Why coaches encouraged imagery use. Using a within subjects ANOVA, a significant effect was found to exist for why coaches encourage their athletes to use imagery, $F(4, 856) = 75.11, p < .001$. Furthermore, Tukey HSD post hoc tests specified that coaches encouraged imagery use for MG-M purposes (i.e., mental toughness, focus, confidence, and positivism) significantly more than any of the other functions of imagery use ($p < .05$). The CS and CG functions of imagery were the second and third most encouraged functions of imagery, respectively, and were the only ones not found to differ statistically ($p > .05$). Coaches encouraged MG-A imagery (i.e., regulation of arousal and stress levels) significantly less than MG-M, CS, and CG ($p < .001$), and finally the MS function of imagery (i.e., imagining goals and activities to meet those goals) was

Table 2

Means and Standard Deviations for Imagery Use for All Items on the CEIUAQ

Parts of CEIUAQ	Items on the Questionnaire	M	SD
Part A	Practice	3.65	1.84
"Where/ When"	Outside practice	2.99	1.91
	Conjunction with competition	4.18	1.99
	While injured	2.39	1.87
	After competing	2.65	1.79
	Just before competing	4.55	2.00
	Before going to bed	2.70	2.08
Part B	CG imagery	3.86	1.73
"Why"	CS imagery	3.95	1.75
	MG-A imagery	3.48	1.55
	MG-M imagery	4.08	1.71
	MS imagery	2.85	1.50
Part C	External imagery	3.02	2.09
"What"	Internal imagery	3.25	1.98
	Visual imagery	4.04	2.14
	Kinesthetic imagery	3.60	2.27
	To make images as accurate as possible	3.85	2.21
	To make images as vivid as possible	3.69	2.25
	To do imagery in real time	3.47	2.27
	Plan sessions	2.53	1.83
	On a regular basis	3.62	2.19
	Auditory imagery	2.54	1.83

Note: All items were rated on a 7-point scale, where 1 = I rarely encourage my current athletes to use imagery and 7 = I often encourage my current athletes to use imagery.

encouraged the least by coaches and significantly less than all the other functions of imagery ($p < .001$).

What coaches encourage their athletes to image. A within subjects ANOVA indicated a significant effect for the perspective (internal/external) used to image, F (1, 214) = 4.19, $p < .05$. Coaches encouraged the use of an internal imagery perspective significantly more than the use of an external imagery perspective.

In regards to type of imagery used, again a within subjects ANOVA proved significant F (2, 428) = 66.02, $p < .001$. Further analysis using Tukey HSD post hoc tests indicated that all three types of imagery were significantly different ($p < .001$). Coaches encouraged their athletes to use visual imagery the most, followed by the use kinesthetic imagery, and auditory imagery. Concerning the effectiveness of athletes' imagery use, a within subjects ANOVA indicated a significant effect, F (2, 416) = 9.27, $p < .001$. Follow-up Tukey HSD post hoc tests specified that coaches encouraged athletes to have accurate images significantly more than they encouraged athletes to have vivid images ($p < .001$), and they encouraged both accuracy and vividness of images significantly more than they encouraged doing images in real time ($p < .001$).

Finally, a within subjects ANOVA found that a significant effect existed for imagery sessions, F (1, 214) = 81.54, $p < .001$. Coaches encouraged the use of imagery on a regular basis significantly more than they promoted the specific planning of imagery sessions.

Internal consistency of Part C of the CEIUAQ. Given Part C of the CEIUAQ is comprised of the five subscales from the SIQ, the internal consistency of each subscale (CS, CG, MS, MG-M, and MG-A) was evaluated with Cronbach's alpha. The criterion

level was set at an alpha coefficient of .70 (Nunnally, 1978). All subscales had acceptable internal consistencies: CG = .80, CS = .92, MG-M = .90, MG-A = .90, and MS = .86.

Correlations. Correlations were calculated for the two continuous variables from Part A of the questionnaire, coaches' age and the number of years coaching at their present level, and all the items from Parts B and D of the CEIUAQ as well as the subscales from Part C of the CEIUAQ. No correlations proved to be significant. In addition, the relationships among coaches' age, the number of years coaching at their current level, coaches' NCCP level, and the highest level of athlete coached were examined. Coaches' age was found to be significantly correlated with number of years coaching at the present level, $r = 0.61, p < .001$; coaches' NCCP level, $r = 0.31, p < .001$; and level of athlete presently coached, $r = 0.24, p < .001$. Number of years coaching at the present level was also found to be significantly correlated with both coaches' NCCP level, $r = 0.35, p < .001$, and with level of athlete presently coached, $r = 0.18, p < .01$. Due to these findings, both coaches' age and number of years coaching at the present level were not examined in subsequent analyses.

Finally, coaches' NCCP level and the level of athlete with which they were presently coaching were also found to be significantly correlated, $r = 0.46, p < .001$.

Frequency analyses. It was deemed that coaches' gender, coaches' NCCP level, and level of athlete presently coached might interact. For example, NCCP level 3 coaches may tend to be male and work more with athletes at higher competitive levels. In fact, Jedlic (2003) found higher level coaches tended to be male. Therefore, it was necessary to determine whether interactions occurred between the independent variables in the present study. Frequencies were calculated for coaches' gender (i.e., male and female) by

coaches' NCCP level (see Table 3). Since there were only a few coaches certified at NCCP levels 4 and 5, these levels were combined with level 3. The table cell frequencies indicated that there were only 8 female NCCP level 2 coaches. Given the small number of female coaches at this level and that the Chi-square was not significant [$\chi^2 = 6.472$, $df = 3$, $p > .05$], coaches' gender and NCCP level were considered separately in subsequent analyses. In addition, frequencies were calculated for coaches' gender by the level of athlete presently coached (see Table 4). Again, due to small numbers of coaches working with athletes at certain levels of competition (i.e., provincial, international), some groups were combined for analyses involving level of athlete presently coached. Coaches currently working with provincial and varsity athletes were grouped together, while coaches currently working with national and international level athletes were grouped together. The table cell frequencies and a Chi-square analysis [$\chi^2 = 10.904$, $df = 3$, $p < .05$] indicated that coaches' gender interacted with the level of athlete presently coached. Coaches currently working with athletes at higher competitive levels (i.e., national and international level) tended to be male. As a result of these analyses, coaches' gender and the level of athlete presently coached were also considered separately in subsequent analyses.

A final frequency analysis was conducted for coaches' NCCP level by the level of athlete presently coached (see Table 5). The table cell frequencies and a Chi-square analysis [$\chi^2 = 33.387$, $df = 6$, $p < .001$] demonstrated that coaches' NCCP level interacted with the level of athlete presently coached. Coaches that held higher NCCP level certification (levels 3-5) were more likely to be working with athletes that competed at higher levels (i.e., national and international level). Due to the results from these

Table 3

Number of Male and Female Coaches by NCCP Level

Coaches' Gender	NCCP Level			
	Level 1	Level 2	Level 3-5	Total
Male	24	33	32	89
Female	13	8	18	39
Total	37	41	50	128

Note: People who did not report an NCCP level were omitted from these statistics.

Table 4

Number of Male and Female Coaches by Level of Athlete Presently Coached

Coaches' Gender	Level of Athlete Coaches Presently Coached: Recreational	Club	Provincial/ Varsity	National/ International	Total
Male	25	42	51	21	139
Female	28	17	18	13	76
Total	53	59	69	34	215

Table 5

Coaches' NCCP Level by Level of Athlete Presently Coached

Coaches' NCCP Level	Level of Athlete Presently Coached				
	Recreational	Club	Provincial/ Varsity	National/ International	Total
Level 1	10	18	6	3	37
Level 2	3	16	15	7	41
Levels 3-5	3	6	22	19	50
Total	16	40	43	29	128

Note: People who did not report an NCCP level were omitted from these statistics.

analyses, coaches' NCCP level and the level of athlete presently coached were also considered separately in subsequent analyses.

Since only 15.8% of the coaches reported that a sport psychologist was working with their present athletes, this variable was not considered in the analyses. As might be expected, coaches of national/international athletes were more likely to report that their athletes worked with a sport psychologist.

Coaches' Gender

To determine whether coaches' gender had an influence on "where and when" they encouraged their athletes to utilize imagery, a MANOVA was performed using coaches' gender as the independent variable and the items examining "where and when" coaches encourage their athletes to use imagery (i.e., in practice, outside of practice, in conjunction with competition, when injured, post-competition, just before competing, and before going to bed) as the dependent variables. The multivariate effect proved to be significant, Pillai's Trace = .092, F (7,207) = 2.996, $p < .01$, with an observed power of 93%. However, when a Bonferroni adjustment was implemented to control for Type 1 errors when using multiple comparisons ($p < .007$), there were no significant univariate effects (the effect for using imagery in conjunction with competition just failed to be significant). Means and standard deviations for the "where and when" items of encouraged imagery use based on coaches' gender are presented in Table 6.

As a means of establishing whether coaches' gender influenced "why" coaches encouraged their athletes to use imagery, again a MANOVA was conducted using coaches' gender as the independent variable and the five sub-scales examining "why" coaches encourage their athletes to use imagery (i.e., CG, CS, MG-M, MG-A, MS) as the

Table 6

Means and Standard Deviations for Imagery Use Based on Coaches' Gender

Parts of CEIUAQ	Items on the Questionnaire	Gender	
		Male Mean (SD)	Female Mean (SD)
Part A	Practice	3.57 (1.87)	3.80 (1.77)
"Where/	Outside practice	2.88 (1.86)	3.18 (1.99)
When"	Conjunction with competition	3.96 (2.02)	4.59 (1.88)
	While injured	2.32 (1.78)	2.53 (2.04)
	After competing	2.80 (1.84)	2.42 (1.68)
	Just before competing	4.52 (1.99)	4.61 (2.03)
	Before going to bed	2.56 (2.02)	2.95 (2.17)
Part B	CG imagery	3.79 (1.62)	3.97 (1.92)
"Why"	CS imagery	3.84 (1.78)	4.15 (1.69)
	MG-A imagery	3.45 (1.60)	3.56 (1.45)
	MG-M imagery	4.01 (1.76)	4.21 (1.61)
	MS imagery	2.88 (1.52)	2.77 (1.46)
Part C	External imagery	2.91 (2.09)	3.24 (2.08)
"What"	Internal imagery	3.17 (2.04)	3.39 (1.86)
	Visual imagery	3.90 (2.12)	4.30 (2.17)
	Kinesthetic imagery	3.41 (2.28)	3.95 (2.22)
	To make images as accurate as possible	3.56 (2.14)	4.37 (2.26)
	To make images as vivid as possible	3.43 (2.21)	4.16 (2.26)
	To do imagery in real time	3.17 (2.18)	4.03 (2.33)
	Plan sessions	2.55 (1.88)	2.49 (1.72)
	On a regular basis	3.46 (2.22)	3.91 (2.11)
	Auditory imagery	2.49 (1.81)	2.64 (1.83)

Note: All items were rated on a 7-point scale, where 1 = the coach rarely encourages the athlete to use imagery and 7 = the coach often encourages the athlete to use imagery.

dependent variables. The multivariate effect proved not to be significant, Pillai's Trace = .018, F (5,209) = .775, p >.05. Means and standard deviations for encouraged CG, CS, MG-M, MG-A, and MS imagery based on coaches' gender are presented in Table 6.

To investigate whether coaches' gender had an influence on "what" coaches encouraged their athletes to image, a MANOVA was performed using coaches' gender as the independent variable and the items examining "what" coaches encourage their athletes to image (i.e., external imagery perspective, internal imagery perspective, visual imagery, kinesthetic imagery, accurate images, vivid images, images in real time, planned imagery sessions, imagery on a regular basis, and auditory imagery) as the dependent variables. Again the multivariate effect proved not to be significant, Pillai's Trace = .074, F (10,204) = 1.631, p >.05. Means and standard deviations for the "what" items of encouraged imagery use based on coaches' gender are presented in Table 6.

Coaches' NCCP Level

Given there were no significant differences in the encouragement to use imagery given by male and female coaches, and because some of the cell sizes would have been too small, all coaches of both genders reporting a NCCP level of certification were included in the first analyses. A MANOVA was performed to determine whether coaches' NCCP level influenced "where and when" they encouraged their athletes to utilize imagery. Coaches' NCCP level (i.e., Level 1, Level 2, Levels 3-5) served as the independent variable while the items examining "where and when" coaches encouraged their athletes to use imagery served as the dependent variables. This analysis found no significant multivariate effect, Pillai's Trace = .160, F (14, 240) = 1.491, p >.05. Means

and standard deviations for the "where and when" items of encouraged imagery use based on coaches' NCCP level are presented in Table 7.

As a means of establishing whether coaches' NCCP level influenced "why" they encouraged their athletes to use imagery, a MANOVA was conducted using coaches' NCCP level as the independent variable and the five sub-scales examining "why" coaches encouraged their athletes to use imagery as the dependent variables. The multivariate effect proved to be significant, Pillai's Trace = .165, F (10,244) = 2.192, $p <$ .05, with an observed power of 91%. A Bonferroni adjustment was implemented to control for Type 1 errors when using multiple comparisons ($p < .01$), and the only significant univariate effect was for coaches' encouragement of cognitive general imagery, F (4, 215) = 5.074, $p <$. 01, with an observed power of 81%. Tukey Post hoc tests ($p < .05$) indicated that coaches with level 1 NCCP certification encouraged their athletes to use CG imagery (imagery of game plans, strategies of play, and routines) significantly less than coaches with level 2 or higher NCCP certification. Means and standard deviations for encouraged CG, CS, MG-M, MG-A, and MS imagery based on coaches' NCCP level are presented in Table 7.

As a means of establishing whether coaches' NCCP level influenced "what" coaches encouraged their athletes to image, a MANOVA was conducted using coaches' NCCP level as the independent variable and the items examining "what" coaches encourage their athletes to image as the dependent variables. The multivariate effect proved not to be significant, Pillai's Trace = .205, F (20,234) = 1.336, $p >$.05. Means and standard deviations for the "what" items of encouraged imagery use based on coaches' NCCP level are presented in Table 7.

Table 7

Means and Standard Deviations for Imagery Use Based on Coaches' NCCP Level

Parts of CEIUAQ	Items on the Questionnaire	NCCP Level		
		Level 1 Mean (SD)	Level 2 Mean (SD)	Level 3 Mean (SD)
Part A "Where/ When"	Practice	3.41 (1.62)	4.39 (1.80)	4.18 (1.84)
	Outside practice	2.73 (1.84)	3.76 (2.00)	3.48 (1.90)
	Conjunction with competition	4.00 (2.03)	4.93 (1.93)	4.78 (1.90)
	While injured	1.89 (1.29)	2.90 (2.10)	3.16 (2.39)
	After competing	2.57 (1.69)	3.59 (2.05)	2.88 (1.80)
	Just before competing	4.65 (1.87)	5.49 (1.79)	5.10 (1.76)
	Before going to bed	2.35 (1.90)	3.83 (2.30)	3.06 (2.19)
Part B "Why"	CG imagery	3.45 (1.51)	4.52 (1.70)	4.28 (1.49)
	CS imagery	3.79 (1.70)	4.37 (1.80)	4.49 (1.79)
	MG-Arousal imagery	3.27 (1.53)	3.94 (1.68)	3.91 (1.49)
	MG-M imagery	4.03 (1.59)	4.40 (1.85)	4.65 (1.50)
	MS imagery	2.82 (1.49)	3.06 (1.62)	3.04 (1.54)
Part C "What"	External imagery	2.73 (1.95)	3.41 (2.17)	3.16 (2.17)
	Internal imagery	2.95 (1.93)	3.78 (2.03)	3.68 (2.10)
	Visual imagery	3.97 (2.03)	4.39 (2.12)	4.86 (2.11)
	Kinesthetic imagery	3.05 (2.05)	4.24 (2.30)	4.22 (2.53)
	To make images as accurate as possible	3.76 (2.18)	4.46 (2.17)	4.34 (2.31)
	To make images as vivid as possible	3.62 (2.27)	4.10 (2.15)	4.40 (2.42)
	To do imagery in real time	3.46 (2.27)	4.00 (2.29)	4.20 (2.35)
	Plan sessions	2.97 (2.06)	2.95 (1.97)	2.68 (1.83)
	On a regular basis	3.57 (2.05)	4.54 (2.18)	4.24 (2.26)
	Auditory imagery	2.51 (1.92)	2.61 (1.84)	3.30 (2.03)

Note: All items were rated on a 7-point scale, where 1 = I rarely encourage my current athletes to use imagery and 7 = I often encourage my current athletes to use imagery.

A second set of analyses were undertaken to examine whether coaches who reported a NCCP level differed from coaches who did not report a NCCP level. A MANOVA was performed to determine whether reporting a NCCP level influenced "where and when" coaches encouraged their athletes to utilize imagery. Whether coaches reported a NCCP level (i.e., NCCP level reported, NCCP level not reported) served as the independent variable while the items examining "where and when" coaches encouraged their athletes to use imagery served as the dependent variables. The multivariate effect proved to be significant, Pillai's Trace = .125, F (7,207) = 4.240, $p < .001$, with an observed power of 99%. Means and standard deviations for the "where and when" items of encouraged imagery use based on reporting of NCCP level are presented in Table 8.

A Bonferroni adjustment was implemented to control for Type 1 errors when using multiple comparisons ($p < .007$), and significant univariate effects were found for all items examining "where and when" coaches encourage athletes to use imagery: in practice, outside of practice, in conjunction with competition, while injured, post-competition, just before competing, and just before going to bed. The univariate F ratios are provided in Table 9.

To establish whether reporting a NCCP level influenced "why" coaches encouraged their athletes to use imagery, a MANOVA was conducted using whether coaches reported a NCCP level as the independent variable and the five sub-scales examining "why" coaches encouraged their athletes to use imagery as the dependent variables. The multivariate effect proved to be significant, Pillai's Trace = .057, F (5,209) = 2.528, $p < .05$, with an observed power of 78%. Means and standard deviations for the

Table 8

Means and Standard Deviations for Imagery Use Based on Reporting of NCCP Level

Parts of CEIUAQ	Items on the Questionnaire	Reporting of NCCP Level	
		Reported Mean (SD)	Not Reported Mean (SD)
Part A	Practice	4.02 (1.80)	3.10 (1.77)
"Where/	Outside practice	3.35 (1.93)	2.45 (1.75)
When"	Conjunction with competition	4.60 (1.97)	3.56 (1.86)
	While injured	2.71 (2.08)	1.92 (1.40)
	After competing	3.02 (1.89)	2.15 (1.51)
	Just before competing	5.09 (1.82)	3.75 (1.98)
	Before going to bed	3.10 (2.21)	2.10 (1.71)
Part B	CG imagery	4.12 (1.61)	3.47 (1.84)
"Why"	CS imagery	4.25 (1.78)	3.51 (1.62)
	MG-A imagery	3.74 (1.58)	3.11 (1.42)
	MG-M imagery	4.39 (1.66)	3.62 (1.69)
	MS imagery	2.98 (1.54)	2.65 (1.42)
Part C	External imagery	3.12 (2.11)	2.89 (2.05)
"What"	Internal imagery	3.50 (2.05)	2.89 (1.83)
	Visual imagery	4.45 (2.10)	3.44 (2.06)
	Kinesthetic imagery	3.89 (2.37)	3.17 (2.04)
	To make images as accurate as possible	4.21 (2.23)	4.08 (2.30)
	To make images as vivid as possible	4.08 (2.30)	3.11 (2.04)
	To do imagery in real time	3.92 (2.31)	2.82 (2.04)
	Plan sessions	2.85 (1.94)	2.05 (1.55)
	On a regular basis	4.14 (2.19)	2.85 (1.95)
	Auditory imagery	2.85 (1.96)	2.09 (1.52)

Note: All items were rated on a 7-point scale, where 1 = the coach rarely encourages the athlete to use imagery and 7 = the coach often encourages the athlete to use imagery.

Table 9

Univariate Statistical Results and Observed Power for Reporting of NCCP Level

	Univariate F ratios	Observed Power
Where/When		
In practice	$F(1, 213) = 13.752, p <. 001$	96%
Outside of practice	$F(1, 213) = 12.219, p < .001$	94%
In conjunction with competition	$F(1, 213) = 15.055, p < .001$	97%
When injured	$F(1, 213) = 9.614, p < .01$	87%
Post-competition	$F(1, 213) = 12.793, p < .001$	95%
Just before competing	$F(1, 213) = 26.348, p < .001$	100%
Just before going to bed	$F(1, 213) = 12.637, p < .001$	94%
Why		
CG imagery	$F(1, 213) = 7.435, p < .01$	78%
CS imagery	$F(1, 213) = 9.602, p < .01$	87%
MG-A imagery	$F(1, 213) = 8.813, p < .01$	84%
MG-M imagery	$F(1, 213) = 11.211, p < .001$	92%
What		
Visual imagery	$F(1, 213) = 12.292, p < .001$	94%
Accuracy	$F(1, 213) = 8.913, p < .01$	84%
Vividness	$F(1, 213) = 9.898, p < .001$	88%
Images in real time	$F(1, 213) = 13.043, p < .001$	95%
Planning imagery sessions	$F(1, 213) = 10.467, p < .001$	90%
Use imagery on a regular basis	$F(1, 213) = 19.563, p < .001$	99%
Auditory imagery	$F(1, 213) = 9.260, p < .01$	86%

"why" subscales of encouraged imagery use based on reporting of NCCP level are presented in Table 8.

A Bonferroni adjustment was implemented to control for Type 1 errors when using multiple comparisons ($p < .01$), and significant univariate effects were found for four of the five functions of "why" coaches encourage athletes to use imagery: CS imagery, CG, imagery, MG-M imagery, and MG-A imagery. The univariate F ratios are provided in Table 9.

Finally, a MANOVA was performed to determine whether reporting a NCCP level influenced "what" coaches encouraged their athletes to image. Whether coaches reported a NCCP level served as the independent variable while the items examining "what" coaches encouraged their athletes to image served as the dependent variables. The multivariate effect proved to be significant, Pillai's Trace = .129, $F(10,204) = 3.020$, $p < .001$, with an observed power of 98%. Means and standard deviations for the "what" items of encouraged imagery use based on reporting of NCCP level are presented in Table 8.

A Bonferroni adjustment was implemented to control for Type 1 errors when using multiple comparisons ($p < .005$), and significant univariate effects were found for seven of the "what" items of encouraged imagery use: visual imagery, making images as accurate as possible, making images as vivid as possible, real time, planning imagery sessions, imaging on a regular basis, and auditory imagery. The univariate F ratios are provided in Table 9.

Level of Athlete Presently Coached

A MANOVA was performed to determine whether the level of athlete presently coached influenced "where and when" coaches encouraged their athletes to utilize imagery. All coaches were included in these analyses. The level of athlete presently coached (i.e., recreational, club, provincial/varsity, national/international) served as the independent variable while the items examining "where and when" coaches encouraged their athletes to use imagery served as the dependent variables. The multivariate effect proved to be significant, Pillai's Trace = .274, $F(21,621) = 2.971, p < .001$, with an observed power of 100%. Means and standard deviations for the "where and when" items of encouraged imagery use based on level of athlete presently coached are presented in Table 10.

A Bonferroni adjustment was implemented to control for Type 1 errors when using multiple comparisons ($p < .007$), and significant univariate effects were found for all items examining "where and when" coaches encourage athletes to use imagery: imagery in practice, imagery outside of practice, imagery in conjunction with competition, imagery while injured, imagery post-competition, imagery just before competing, and imagery just before going to bed. The univariate F ratios are provided in Table 11.

Tukey post hoc tests ($p < .05$) indicated that coaches of athletes competing at a recreational level encouraged significantly less use of imagery outside of practice, in conjunction with competition, and just prior to competing than coaches of athletes at higher competitive levels (i.e., club, provincial/varsity, national/international).

Table 10

Means and Standard Deviations for Imagery Use Based on Level of Athlete Coached

		Level of Athlete Presently Coached			
		Recreational	Club	Provincial/ Varsity	National/ International
Parts of CEIUAQ	Items on the Questionnaire	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Part A	Practice	2.75 (1.69)	3.85 (1.80)	3.58 (1.64)	4.85 (1.83)
"Where/	Outside practice	1.96 (1.46)	3.08 (2.10)	3.25 (1.60)	3.88 (2.13)
When"	Conjunction with competition	3.17 (1.78)	4.10 (1.95)	4.26 (1.94)	5.74 (1.44)
	While injured	1.57 (1.08)	2.14 (1.67)	2.62 (1.86)	3.65 (2.44)
	After competing	1.83 (1.27)	2.66 (1.90)	2.86 (1.65)	3.59 (2.06)
	Just before competing	3.55 (2.01)	4.64 (2.06)	4.48 (1.81)	6.09 (1.11)
	Before going to bed	1.74 (1.71)	2.63 (1.97)	2.99 (2.00)	3.74 (2.33)
Part B	CG imagery	3.25 (2.02)	3.75 (1.70)	3.91 (1.60)	4.89 (1.00)
"Why"	CS imagery	3.27 (1.58)	3.79 (1.77)	3.98 (1.74)	5.19 (1.38)
	MG-A imagery	2.89 (1.42)	3.36 (1.57)	3.62 (1.52)	4.34 (1.36)
	MG-Mastery imagery	3.35 (1.58)	4.08 (1.78)	4.12 (1.62)	5.11 (1.43)
	MS imagery	2.38 (1.42)	2.87 (1.57)	3.01 (1.45)	3.18 (1.48)
Part C	External imagery	2.09 (1.54)	2.83 (2.11)	3.32 (2.13)	4.21 (2.07)
"What"	Internal imagery	2.38 (1.40)	3.17 (2.17)	3.36 (1.95)	4.53 (1.81)
	Visual imagery	3.17 (1.87)	3.86 (2.25)	4.28 (2.12)	5.24 (1.79)
	Kinesthetic imagery	2.72 (1.74)	3.53 (2.32)	3.65 (2.31)	5.00 (2.20)
	To make images as accurate as possible	3.17 (2.13)	3.64 (2.34)	3.77 (2.03)	5.41 (1.76)
	To make images as vivid as possible	3.00 (2.09)	3.44 (2.24)	3.62 (2.17)	5.332 (1.93)
	To do imagery in real time	3.04 (2.21)	3.27 (2.26)	3.23 (2.21)	5.00 (1.91)
	Plan sessions	2.13 (1.63)	2.39 (1.85)	2.43 (1.69)	3.56 (2.07)
	On a regular basis	2.62 (1.84)	3.42 (2.16)	3.78 (2.13)	5.18 (1.99)
	Auditory imagery	2.21 (1.74)	2.22 (1.72)	2.61 (1.69)	3.50 (2.14)

Note: All items were rated on a 7-point scale, where 1 = I rarely encourage my current athletes to use imagery and 7 = I often encourage my current athletes to use imagery.

Table 11

Univariate Statistical Results for Level of Athlete Presently Coached

	Univariate F ratios	Observed Power
Where/When		
In practice	$F(6, 215) = 10.555, p < .001$	100%
Outside of practice	$F(6, 215) = 8.971, p < .001$	100%
In conjunction with competition	$F(6, 215) = 13.609, p < .001$	100%
When injured	$F(6, 215) = 10.463, p < .001$	100%
Post-competition	$F(6, 215) = 7.792, p < .001$	99%
Just before competing	$F(6, 215) = 13.177, p < .001$	100%
Just before going to bed	$F(6, 215) = 7.769, p < .001$	99%
Why		
CG imagery	$F(4, 215) = 6.821, p < .001$	98%
CS imagery	$F(4, 215) = 9.439, p < .001$	100%
MG-A imagery	$F(4, 215) = 6.927, p < .001$	98%
MG-M imagery	$F(4, 215) = 8.088, p < .001$	99%
What		
External perspective	$F(9, 215) = 8.608, p < .001$	99%
Internal perspective	$F(9, 215) = 9.230, p < .001$	100%
Visual imagery	$F(9, 215) = 7.488, p < .001$	99%
Kinesthetic imagery	$F(9, 215) = 7.698, p < .001$	99%
Making their images as accurate as possible	$F(9, 215) = 8.301, p < .001$	99%
Making their images as vivid as possible	$F(9, 215) = 8.767, p < .001$	100%
Images in real time	$F(9, 215) = 6.721, p < .001$	97%
Use imagery on a regular basis	$F(9, 215) = 11.055, p < .001$	100%

Furthermore, coaches of national/international level athletes encouraged use of imagery in conjunction with competition and just before competing significantly more than all of their lower level counterparts (i.e., coaches of recreational, club, or provincial/varsity level athletes). Coaches' encouragement of athletes' use of imagery in practice was done significantly more by coaches of club level and national/international level athletes than coaches of recreational level athletes, as well as, coaches of national/ international level athletes encouraged the use of imagery in practice significantly more than coaches of provincial/varsity level athletes. Finally, coaches' encouragement of athletes using imagery while injured, post competition, and just before going to bed was significantly greater for coaches of athletes competing at a national/international level than coaches of athletes competing at a recreational or club level.

As a means of establishing whether the level of athlete presently coached influenced "why" coaches encouraged their athletes to use imagery, a MANOVA was conducted using level of athlete presently coached as the independent variable and the five sub-scales examining "why" coaches encouraged their athletes to use imagery as the dependent variables. The multivariate effect proved to be significant, Pillai's Trace = .163, F (15,627) = 2.407, $p < .01$, with an observed power of 99%. Means and standard deviations for encouraged CG, CS, MG-M, MG-A, and MS imagery use based on level of athlete presently coached are presented in Table 10.

A Bonferroni adjustment was implemented to control for Type 1 errors when using multiple comparisons ($p < .01$). Significant univariate effects were revealed for four of the five subscales pertaining to "why" coaches encouraged athletes to image: CG

imagery, CS imagery, MG-A imagery, and MG-M imagery. The univariate F ratios are given in Table 11.

Tukey post hoc tests ($p < .05$) showed that coaches of national/international level athletes encouraged the use of the two cognitive functions of imagery (i.e., CG and CS) significantly more than coaches of lower competitive level athletes (i.e., coaches of recreational, club, and provincial/varsity level athletes). Furthermore, coaches of national/international level athletes encouraged significantly more use of MG-A imagery than coaches of recreational or club level athletes. Finally, coaches of athletes that compete at a provincial/varsity or national/international level encouraged significantly more use of MG-M imagery than coaches of athletes competing at a recreational level.

As a means of establishing whether the level of athlete presently coached influenced "what" coaches encouraged their athletes to image, a MANOVA was conducted using level of athlete presently coached as the independent variable and the items examining "what" coaches encourage their athletes to image as the dependent variables. The multivariate effect proved to be significant, Pillai's Trace = .259, F (30,612) = 1.931, $p < .01$, with an observed power of 100%. Means and standard deviations for the "what" items of encouraged imagery use based on level of athlete presently coached are presented in Table 10.

A Bonferroni adjustment was implemented to control for Type 1 errors when using multiple comparisons ($p < .005$). Significant univariate effects were discovered for eight of the ten items pertaining to "what" coaches encouraged their athletes to image: external perspective, internal perspective, visual imagery, kinesthetic imagery, making their images as accurate as possible, making their images as vivid as possible, images in

real time, and use imagery on a regular basis. Again, the univariate F ratios are shown in Table 11.

Tukey post hoc tests ($p < .001$) revealed that coaches of national/international level athletes encouraged the use of imagery significantly more than coaches working with recreational athletes on all of the "what" items of encouraged imagery use. Furthermore, coaches of national/international level athletes encouraged the use of imagery significantly more than all their lower level counterparts on several of the "what" items of encouraged imagery use; specifically, internal perspective, kinesthetic imagery, making images as accurate and vivid as possible, imaging in real time, and using imagery on a regular basis. In addition, coaches of athletes competing at a recreational level encouraged the use of imagery significantly less than coaches of provincial/varsity athletes in regards to the use of an external perspective, visual imagery, and using imagery on a regular basis. Finally, coaches of athletes competing at a club level encouraged the use of imagery significantly less than coaches of national/ international level athletes in regards to the use of an external perspective and visual imagery.

Discussion

This study was designed to expand the literature on factors affecting athletes' imagery use, as well as further the findings of Jedlic (2003) regarding coaches' influence on their athletes' use of mental imagery. Although the research by Jedlic suggested that coaches provide substantial encouragement for their athletes to use imagery, only the athletes' perceptions of the extent to which coaches encouraged imagery use was assessed. Consequently, the overall purpose of the current study was to focus on coaches'

perspectives regarding the encouragement they provide their athletes to use imagery. In accord with Jedlic's study, the present research suggested that, with the exception of some recreational level coaches, the majority of coaches encourage their athletes to use imagery. This was not surprising considering Hall and Rodgers (1989) reported that figure skating coaches viewed imagery as the most useful psychological skill. It is likely that most coaches in all sports, especially those who work with higher level athletes, are aware or have been informed of the benefits athletes realize from the use of imagery (e.g., enhanced skill and strategy acquisition, increased confidence, and regulation of arousal).

Where Coaches Encourage Imagery Use

It was found that coaches encouraged their athletes to utilize imagery in conjunction with competition more so than in other settings (e.g., practice, injury rehabilitation). This finding corresponds with the fact that several studies have demonstrated that athletes report using imagery the most in conjunction with competition (e.g., Hall et al., 1990; Munroe et al., 2000; Salmon et al., 1994), as well as Jedlic's (2003) finding that athletes reported that their coaches encouraged them to use imagery most often in conjunction with competition. Thus, it seems as though coaches encourage the use of imagery more as a means of enhancing performance than for the purpose of learning a skill. Furthermore, these findings would suggest that with respect to the frequency of what coaches are encouraging their athletes to image, both coaches and athletes report similar results.

It is apparent from both the present study and Jedlic's (2003) study that coaches provide their injured athletes with limited encouragement to use imagery. It may be that coaches leave the encouragement of imagery to practitioners in the rehabilitation setting

(e.g., physiotherapists). Regardless, this lack of encouragement from their coaches may be a reason why athletes report using imagery less for injury rehabilitation than for training and competition (Sordoni, Hall, & Forwell, 2002). This finding was unsettling, given that researchers have outlined the possible benefits of employing imagery during rehabilitation (e.g., increased self-efficacy, enhanced adherence to the rehabilitation program, pain management, faster recovery) and recommended that injured athletes should make extensive use of imagery (Green, 1992; Sordoni et al., 2000; Sordoni et al., 2002). It appears that both athletes and coaches need to be better informed about the role imagery can play during injury rehabilitation.

When Coaches Encourage Imagery Use

In regards to "when" coaches encouraged their athletes to use imagery, it was found coaches promoted imagery use most immediately prior to competition as opposed to post competition. Once again this corresponds with previous research that has found athletes use imagery most immediately before competitions (Munroe et al, 2000), and that coaches are perceived by their athletes to encourage imagery use most for pre-competition (Jedlic, 2003). Thus, it is likely that coaches realize the valuable role imagery plays in helping their athletes to remain focused, execute strategies, manage emotions and arousal levels, and build and maintain self-confident immediately prior to competing.

Why Coaches Encourage Imagery Use

It was shown in the present study that coaches encouraged their athletes to use imagery significantly more for MG-M purposes (i.e., mental toughness, focus, and confidence) than any of the other functions of imagery use. This is in accordance with

Hall et al. (1998) and Moritz et al. (1996) who found that MG-M imagery is used more by athletes than all the other functions. Research has demonstrated the use of MG-M imagery can increase athletes' sport confidence (Callow et al., 2001). This is important given that sport confidence is a major determinant of success (Gould, Weiss, & Weinberg, 1981). Mills, Munroe, and Hall (2000) reported that athletes who have higher self-efficacy (e.g., situational specific self-confidence) in competition are apt to use more MG-M imagery than their low self-efficacy counterparts. Together, these findings suggest that coaches' strong encouragement for their athletes to use MG-M imagery is warranted.

While coaches encouraged MG-M imagery the most in the present study, they encouraged MS imagery (i.e., imagining particular goals and the activities that must be completed for the realization of those goals) significantly less than any of the other imagery functions thus supporting previous research (Hall et al., 1998). Coaches may not be giving as much encouragement for the use of MS imagery because they do not want their athletes to become too focused on outcome goals (goals associated with winning and accomplishments). Munroe-Chandler and colleagues (2004) found that athletes set objective outcome goals more than performance goals for competition. It has been argued that some athletes in certain situations may create unrealistic expectations and thereby increase their anxiety, as well as lower their level of motivation and self-confidence if they focus on outcome goals (Burton, 1989). Other research (e.g., Hardy, Jones, & Gould, 1996), however, has proposed that one of the most effective ways to develop or enhance athletes' practice motivation is through the use of outcome goals, thus reminding athletes of their long-term objectives. Therefore, it may be valuable to

educate coaches on the possible benefits of athletes' use of outcome goals, in addition to the subjective goals set, and how coaches' encouragement of MS imagery may facilitate these benefits.

What Coaches Encourage Their Athletes to Image

With regard to "what" coaches encourage their athletes to image, they encouraged the use of an internal imagery perspective significantly more than the use of an external perspective. This finding does not support the findings from Jedlic's (2003) study examining athletes' perceptions of the imagery encouragement given by coaches. She found athletes indicated their coaches equally encouraged internal and external imagery perspectives. The reason for this discrepancy is not clear. Hardy and his colleagues (e.g., Hardy, 1997; White & Hardy, 1995) argue that task differences can have an influence on which visual perspective an athlete decides to utilize. Moreover, they propose that an internal perspective may be superior for the attainment and performance of skills that rely greatly on anticipation and perception for their successful execution (e.g., hockey, tennis). In contrast, an external perspective may be best for skills that place an emphasis on form (e.g., diving, figure skating). If most of the coaches in the present study coached sports requiring anticipation and perception while most of the athletes in Jedlic's (2003) study were involved in sports emphasizing form, this might explain the discrepancy. In both studies, however, most of the coaches and the athletes were involved in sports demanding anticipation and perception. Further research is needed to determine why this discrepancy existed between the two studies.

Coaches also encouraged the use of visual imagery significantly more than the use of kinesthetic and auditory imagery, respectively. Jedlic (2003) similarly reported that

athletes perceived their coaches encouraged visual imagery more than any other type. This finding seems logical given that vision is the dominant sense and athletes tend to be better visual imagers than kinesthetic imagers (Rodgers et al., 1991). With respect to coaches' lack of encouragement for their athletes to use auditory imagery, this also concurs with previous research. Salmon et al. (1994), in their study with soccer players, noted that although the athletes reported some auditory imagery use, it was considerably less than visual or kinesthetic imagery use. Thus, coaches and athletes appear to agree on the frequency of encouragement for the various types of imagery.

Coaches also indicated they encouraged their athletes to have accurate images significantly more than they encouraged athletes to have vivid images or images in real time. This finding may suggest that coaches think the accuracy of an image is more important than the vividness or speed of an image (assuming greater encouragement implies more perceived importance). This could be due to the fact coaches believe that if athletes can visualize themselves doing a skill correctly, they are more likely to physically perform that skill correctly. Isaac (1992), however, found that athletes with highly vivid images are more likely to improve their physical skills in comparison to similar athletes that have less vivid images. Given this finding, coaches should provide as much encouragement for their athletes to form vivid images as for accurate ones. Whether the same case can be made for encouraging images in real time awaits the findings of research on the topic, and this work is just now being conducted.

The final important finding regarding "what" coaches encouraged their athletes to image involved the frequency of imagery use. Coaches reported they encouraged the use of imagery on a regular basis significantly more than they promoted the specific planning

of imagery sessions. This finding seems to coincide with Jedlic (2003) who found that while athletes reported that coaches provided some encouragement to use imagery on a regular basis, they were less liable to advise their athletes to plan their imagery sessions. Coaches appear, therefore, to believe that imagery use can be an asset to their athletes. Coaches do not approach imagery, however, the same way as they approach physical practice. Research indicates that both physical practice and imagery practice should be treated as forms of deliberate practice (Cumming & Hall, 2002), and accordingly imagery practice should be structured and regular the same way as physical practice. The current study's findings would suggest that coaches need to promote the specific planning of imagery sessions, so as to make their athletes' imagery practice similar to their physical practice.

Coaches' Age and Gender

A relationship was expected between coaches' age and the encouragement of imagery use, however, this proved not to be the case. There were no significant correlations between coaches' age and scores on the CEIUAQ. It was also expected that coaches' age would be related to coaches' NCCP level. It was found that coaches' age was not only related to the coaches' NCCP level, but also with the competitive level of the athletes they were presently coaching. Older coaches were found to have higher NCCP level certification and were coaching athletes of higher competitive levels (i.e., international and national) than their younger counterparts. This finding was expected considering Jedlic (2003) found coaches' age to be confounded with coaches' experience level. Given the time it takes to reach the coaching expertise required to work with high

level athletes, many years of coaching experience are often needed to work with athletes at this level.

The coaches' gender was not expected to have any influence on their encouragement of athletes' imagery use. This hypothesis was supported in the present study. Previous research on imagery use in sport has found minimal evidence to suggest that gender plays a role in the use of imagery in sport (Hall et al., 1990; Munroe et al., 1998; Salmon et al., 1994). Thus, it is not surprising that coaches, regardless of gender, encouraged their athletes to employ imagery to the same extent.

Coaches' NCCP Level

It was hypothesized that coaches with higher NCCP levels would encourage their athletes to employ imagery more than their lower level counterparts. Results indicated that generally coaches' NCCP level did not have a significant influence on their encouragement of imagery, however, there was a trend for coaches with level 1 NCCP certification to provide less encouragement than coaches with level 2 or higher NCCP certification. The only significant difference found between coaches of different NCCP levels was for "why" they encourage their athletes to use imagery. Specifically, results indicated that coaches with level 1 NCCP certification encouraged their athletes to use CG imagery (i.e., imagery of strategies and game plans) significantly less than coaches with level 2 or higher NCCP certification. This finding may be due to the fact that coaches with only level 1 certification are more likely working with younger athletes who are just learning basic skills and are not yet ready to learn strategies of play. In contrast, coaches with level 2 and higher NCCP certification are more likely to coach athletes of

higher competitive levels where developing and carrying out game plans, creating strategies of play, and creating and rehearsing routines may be viewed as more necessary.

The above findings related to coaches' level of NCCP certification should be viewed with some caution. Less than half of the participants in the study actually reported an NCCP level. Furthermore, Jedlic (2003) found that higher level coaches (e.g., national, international), as rated by their athletes, generally encouraged the use of imagery significantly more than lower level coaches (e.g., recreational, club). While it seems reasonable to assume that coaches with higher NCCP levels would also be rated as higher level coaches by their athletes, the two may not directly correspond. Therefore, it is recommended that the relationship between coaches' level, whether determined by their NCCP certification or some alternative method (e.g., self categorization), and the encouragement coaches give their athletes to employ psychological skills such as imagery receive further examination.

The differences found between coaches that reported NCCP level and coaches that did not report NCCP level were of interest. The results indicated that coaches who reported a NCCP level encouraged imagery use significantly more than their unreported counterparts with respect to almost all of the CEIUAQ items. The only non-significant differences were for coaches' encouragement of the MS imagery function, internal and external imagery perspectives, and kinesthetic imagery. It is possible the significant differences were due to the fact that coaches who are NCCP certified may be more dedicated to furthering their coaching knowledge. Thus, these coaches are concerned with developing the skills needed to best serve their athletes and help them achieve success (e.g., imagery).

Level of Athlete Presently Coached

Hall and Rodgers (1989) found that more experienced coaches perceived imagery to be a more useful skill than their less experienced counterparts. Given this finding, a final hypothesis of the present study was that coaches working with athletes of higher competitive levels (i.e., national and international) would encourage their athletes to use imagery more than coaches working with athletes of lower competitive levels (i.e., recreational and club). Overall, support was found for this hypothesis. Coaches of athletes competing at a recreational level encouraged significantly less use of imagery than their national/international level counterparts for all of the "where and when" uses of imagery. Additionally, recreational level coaches encouraged imagery use outside of practice, in conjunction with competition, and just prior to competing significantly less than coaches of athletes at all other levels (i.e., club, provincial/varsity, national/ international). Furthermore, coaches of national/international level athletes encouraged imagery use in conjunction with competition and just before competing significantly more than all of their lower level counterparts.

The significant differences between coaches of recreational level athletes and coaches of national/international level athletes with respect to "where and when" they encourage their athletes to use imagery are not surprising. These differences are very likely due to the fact that coaches of recreational level athletes usually do not have the same coaching education and training as coaches of national/international level athletes, and thus are less apt to know or fully understand "where and when" to encourage their athletes to use imagery. Also, these differences may be a function of athletes' commitment to their sport. It has been proposed that athletes become more committed to

their sport as their competitive level increase and, therefore, becoming more predisposed to using psychological techniques such as imagery (Hall, 2001). Coaches of national/international level athletes are liable to endorse imagery use to their athletes more than coaches of recreational level athletes because these athletes have a willingness to use any technique that may help them achieve peak performance. Furthermore, coaches of national/international level athletes often spend more time with their athletes in comparison to recreational level coaches, and thus have more time in which to encourage imagery use.

In this study, investigation of "why" coaches promoted the use of imagery with their athletes revealed that coaches of national/international level athletes encouraged the use of the two cognitive functions of imagery significantly more than their less experienced counterparts (i.e., coaches of recreational, club, and provincial/varsity level athletes). Furthermore, national/international level coaches encouraged significantly more use of MG-A imagery than coaches of recreational or club level athletes. Finally, provincial/varsity level coaches and national/international level coaches encouraged significantly more use of MG-M imagery than coaches of athletes competing at a recreational level. As with "where and when" coaches encouraged imagery use, one of the reasons for the significant differences between recreational level coaches and national/international level coaches as to "why" they encourage imagery use is most likely to do with recreational coaches' lack of education with respect to imagery use and understanding in regards to the benefits of imagery use. In addition, it is probable that recreational level coaches spend less time working with their athletes and thus have less time to encourage the functions of imagery. The reason that coaches of provincial/varsity

or national/ international level athletes encouraged significantly more use of MG-M imagery than coaches of recreational athletes is probably due to the fact that being confident, focused, and mentally tough becomes more important for achieving success at higher levels of competition (Cumming, Hall, & Shambrook, 2004). The benefits athletes experience from using MG-M imagery has been repeatedly reported in applied sport psychology practice (e.g., Orlick, 1990; Rushall, 1988; Suinn, 1996), and therefore it is not surprising that it is also greatly encouraged by coaches of high level athletes who desire success.

It was found that coaches of national/international level athletes promoted all of the "what" items significantly more than their recreational level counterparts. Additionally, national/international level coaches encouraged their athletes to use an internal perspective, employ kinesthetic imagery, make images as accurate and vivid as possible, imagine in real time, and use imagery on a regular basis significantly more than their lower level counterparts (i.e., recreational, club, and provincial/varsity level coaches). This may also be due to the fact that coaches of national/international level athletes are often more educated and experienced in regards to "what" their athletes should image. Numerous sports offer coaching conferences and workshops where topics such as imagery are covered, but it is typically the higher level coaches that participate in these learning opportunities. One could assume, given that many coaches at a national/ international level make coaching a career, their attendance at educational workshops is part of their job that must be fulfilled. Moreover, national/international level coaches are more likely than lower level coaches to encourage imagery use on a regular basis because they realize that imagery practice would be most beneficial to their athletes if it is done

deliberately and regularly. With respect to the use of kinesthetic imagery, the reason coaches of higher level athletes encourage its use more than coaches of lower level athletes could be that elite level athletes are able to feel movements of a skill better than their lower level counterparts (Barr & Hall, 1992), and thus benefit more from the use of kinaesthetic imagery when it is encouraged by their coaches. Coaches of national/international level athletes likely encourage the vividness and accuracy of images, and doing images in real time more than coaches of lower level athletes because small improvements in practice at the elite level can be the difference between winning and losing.

Limitations

Although this research represents a comprehensive investigation of the encouragement coaches provide their athletes to use imagery, it is not without its limitations. One limitation to this study is that it utilizes a self-report questionnaire in which it relies completely on coaches' ability to truthfully recall and report their own encouragement of imagery use. Self-presentation, a term used to describe a person's attempt to create a desired impression upon others, is a potential limitation. Given that coaches may want to self-present as a knowledgeable coach, their responses may be inflated.

A second limitation to this study involves the demographic grouping of coaches (i.e., NCCP levels 3-5, coaches of provincial and varsity athletes, and coaches of national and international athletes). These groupings emerged because of the small number of coaches from certain demographics. Completing the analyses using such small groups

would not have been appropriate because it would have produced results that may not have been reliable.

A third limitation to the present study was the use of coaches' NCCP level in the analyses. Many of the coaches in the study (41%) did not indicate their NCCP level, and therefore could not be included in those analyses in which it was required. Because of this, some analyses using NCCP level as a variable do not provide generalizable results. Furthermore, coaches' NCCP level could not be directly compared to coaches' experience level from Jedlic's (2003) study. Specifically, coaches with higher level NCCP certification are not always the coaches with highest level of experience. In addition to these points, the NCCP is currently being revised. Consequently the present study's results involving NCCP level will soon be outdated. In addition, the format of the CEIUAQ used in the present study did not allow participants to indicate "no NCCP certification". Therefore, it was difficult to discern whether participants did not have NCCP certification or whether they simply chose not to report it.

Using a convenient sample with respect to the sport coached is a final limitation to the present study. The results of the present study may not accurately reflect what all coaches in all sports are doing with respect to the encouragement of athletes' imagery use. Hence, the generalizability of the results must be taken with caution.

Future Directions

In addition to the future directions offered above, there are other avenues of research that could be explored. One specific future direction would be a replication of the present study with coaches working with athletes in one particular sport (e.g., volleyball coaches). Given that task has been found to influence athletes' imagery use,

conducting such a study would allow researchers to examine the impact that task may have on coaches' encouragement of imagery with their athletes.

Another possible direction for future research would be to examine coaches' encouragement of imagery use in a study that employs both athletes and coaches in the sample. A study in which elite level athletes and their respective coaches were simultaneously examined with respect to coaches' encouragement of imagery use would allow for direct comparisons between the two populations. These comparisons would permit researchers to investigate any specific discrepancies that might exist between the imagery use coaches are encouraging and the imagery use athletes perceive their coaches are encouraging. A study of this nature, however, would be a very difficult undertaking as the coaches and athletes included in the study should be all of the same competitive level, and from the same sport.

In order clarify coaches' NCCP level; future questionnaires should include several options for the respondent rather than just NCCP level. This may include NCCP level 1-5, no NCCP level and a blank space to allow international respondents to report their equivalent certification. This would allow researchers to have a clearer understanding of the participants' demographics.

Practical Implications

There are a number of practical implications stemming from the present study. The results indicate that coaches are encouraging their athletes to use imagery, however, it is encouraged significantly more by coaches of elite level (national/ international) athletes. Thus, it would be beneficial for coaches of recreational level athletes to be made aware of the many benefits (i.e., increased focus, increased self-confidence) even

beginner athletes can reap from using imagery. Specifically, recreational level coaches would benefit greatly from educational workshops specific to the importance of incorporating regular planned imagery use sessions into practice, as well as the importance of encouraging CG imagery to help their athletes better succeed with their strategies and game plans. If coaches of recreational level athletes are better informed about imagery use they will become more confident in their understanding of mental skills and will more readily encourage effective imagery use. As noted above, the NCCP is currently being revised. Based on the present study's findings, it is suggested that mental skills training be introduced earlier in the program (i.e., Level 1), and covered more extensively at each progressive level.

Coaches in the present study reported encouraging imagery use significantly less for practice than competition. This trend needs to be remedied. This finding would suggest that coaches may not fully comprehend the benefits imagery can have in conjunction with practice, such as, helping to relieve boredom and assisting in the learning of skills and strategies as suggested by Munroe and colleagues (2000). Practitioners, therefore, need to provide coaches with information on its benefits and implementation strategies for imagery use in practice. Once armed with this knowledge, coaches will be more likely to promote more imagery use in conjunction with practice, and do so in an effective manner.

In addition to these practical implications mentioned above, coaches need to increase the frequency with which they encourage their athletes to use imagery when injured. Often athletes are not capable of participating in a full physical practice when injured. Coaches should, therefore, be promoting their injured athletes to do mental

practice to compensate for this lack of physical practice. Injured athletes can experience increased self-confidence, decreased anxiety regarding their injury, increased motivation to recover, and pain relief by utilizing imagery while undergoing rehabilitation (Sordoni et al., 2000).

Lastly, coaches should be encouraging their athletes to use other types of imagery (i.e., kinesthetic, auditory) in addition to visual imagery. Coaches appear to be highly supportive of visual imagery, however, using all of the senses will improve the athletes' images (Munroe et al., 2000; Weinberg & Gould, 2003).

Conclusion

Given the findings of the present study and the results of previous imagery studies (e.g., Hall et al., 1998; Jedlic, 2003; Munroe et al., 1998), it appears that coaches and athletes generally agree on how frequently the various functions and content of imagery are encouraged. Coaches promote the use of imagery to their athletes, especially in conjunction with competition, although higher level coaches encourage imagery far more than their recreational counterparts. Because coaches encourage imagery use the most immediately prior to competitions, it corresponds that substantially more encouragement is given for MG-M purposes (increasing self-confidence, staying focused). Specifically, athletes often experience feelings such as anxiety, nervousness, and doubt immediately prior to competitions and, therefore can benefit greatly from MG-M imagery use (Callow et al., 2001).

This study confirmed the suggestion by Jedlic (2003) and Munroe et al. (1998) that coaches could be listed among the several factors having an influence on athletes' imagery use. In addition, the level of athlete coached appears to have a major impact on

exactly how much or little coaches encourage their athletes' to use imagery. Although this study does not identify whether coaches' encouragement of imagery use is as influential as other factors (e.g., skill level, type of sport), the impact coaches have on athletes' imagery remains of great significance. It is vital that coaches of all levels understand their influence is not limited to development of athletes' physical skills, but is also a major factor affecting athletes' psychological skills. By encouraging their athletes to use imagery, coaches are providing their athletes with the best possible tools for success.

References

Barr, K., & Hall, C. (1992). The use of imagery by rowers. *International Journal of Sport Psychology, 23*, 243-261.

Blair, A., Hall, C., & Leyshon, G. (1993). Imagery effects on the performance of skilled and novice soccer players. *Journal of Sport Sciences, 11*, 95-101.

Bloom, G.A., Stevens, D.E., & Wickwire, T.L. (2003). Expert coaches' perceptions of team building. *Journal of Applied Sport Psychology, 15*, 129-143.

Burton, D. (1989). The impact of goal specificity and task complexity on basketball skill development. *The Sport Psychologist, 3*, 34-47.

Burton, D., Weinberg, R.S., Yukelson, D., & Weigand, D.A. (1998). The goal effectiveness paradox in sport: Examining the goal practices of collegiate athletes. *The Sport Psychologist, 12*, 404-418.

Callow, N., Hardy, L., & Hall, C. (2001). The effects of a motivational general-mastery imagery intervention on the sport confidence of high-level badminton players. *Research Quarterly for Exercise and Sport, 72*, 389-400.

Cumming, J., & Hall, C. (2002). Athletes' use of imagery in the off-season. *The Sport Psychologist, 16*, 160-172.

Cumming, J., Hall, C., & Shambrook, C. (2004). The influence of an imagery workshop on athletes' use of imagery. *Athletic Insight, 6*. Retrieved January 4, 2005, from http://www.athleticinsight.com.

Denis, M. (1985). Visual imagery and the use of mental practice in the development of motor skills. *Canadian Journal of Applied Sport Sciences, 10*, 4S-16S.

Durand, M., Hall, C., Haslam, I.R. (1997). The effects of combining mental and physical practice on motor skill acquisition: A review of the literature and some practical implications. *The Hong Kong Journal of Sports Medicine and Sports Science, 4*, 36-41.

Feltz, D. L., & Landers, D. M. (1983). The effects of mental practice on motor skill learning and performance: A meta-analysis. *Journal of Sport Psychology, 5*, 25-57.

Goss, S., Hall, C., Buckolz, E., & Fishburne, G. (1986). Imagery ability and the acquisition of retention of movements. *Memory and Cognition, 14*, 469-477.

Gould, D., Guinan, D., Greenleaf, C., & Yongchul, C. (2002). A survey of U.S. Olympic coaches: Variables perceived to have influenced athlete performances and coach effectiveness. *The Sport Psychologist, 16*, 229-250.

Gould, D, Weiss, M., & Weinberg, R. (1981). Psychological characteristics of successful and non-successful big ten wrestlers. *Journal of Sport Psychology, 3*, 69-81.

Green, L. (1992). The use of imagery in rehabilitation of injured athletes. *The Sport Psychologist, 6*, 416-428.

Hall, C. (2001). Imagery in sport and exercise (2nd ed.). In R. Singer, H. Hausenblas, & C. Janelle (Eds.), *Handbook of sport psychology* (pp. 529 – 549). New York, NY: John Wiley & Sons, Inc.

Hall, C.R., Buckolz, E., & Fishburne, G.J. (1989). Searching for a relationship between imagery ability and memory of movements. *Journal of Human Movement Studies, 17*, 89-100.

Hall, C., Mack, D., Paivio, A., & Hausenblas, H. (1998). Imagery use by athletes: Development of the Sport Imagery Questionnaire. *International Journal of Sport Psychology, 29*, 73-89.

Hall, C., & Rodgers, W. (1989). Enhancing coaching effectiveness in figure skating through a mental skills training program. *The Sport Psychologist, 3,* 142-154.

Hall, C., Rodgers, W., & Barr, K. (1990). The use of imagery by athletes in selected sports. *The Sport Psychologist, 4,* 1-10.

Hall, C.R., Schmidt, D., Durand, M., & Buckolz, E. (1994). Imagery and motor skills acquisition. In A.A. Sheikh & E.R. Korn (Eds.), *Imagery in sports and physical performance* (pp. 121-134). Amityville, NY: Baywood.

Hardy, J., Gammage, K., & Hall, C. (2001). A descriptive study of athlete self-talk. *The Sport Psychologist, 15*, 306-318.

Hardy, L. (1997). Three myths about applied consultancy work. *Journal of Applied Sport Psychology, 9*, 277-294.

Hardy, L., Jones, J., & Gould. (1996). *Understanding psychological preparation for sport: Theory and practice of elite performers.* Chichester, England: Wiley.

Howe, B. (1996). Integrating mental skills with training assistant coaches at the NCI Victoria. *Paper presented at the Coaching, Sport Medicine and Sport Science Conference – Wellington, New Zealand.*

Isaac, A. (1992) Mental practice – does it work in the field? *The Sport Psychologist, 6*, 192-198.

Jedlic, B. (2003). *Coaches' influence on athletes' use of imagery: Athletes' Perceptions.* Unpublished master's thesis, University of Western Ontario, London, Ontario, Canada.

Lynch, J. (2001). *Creative coaching.* Champaign, IL: Human Kinetics.

Martens, R. (2004). *Successful coaching – 3rd* edition. Champaign, IL: Human Kinetics.

McBride, E.R., & Rothstein, A.L. (1979). Mental and physical practice and the learning and retention of open and closed skills. *Perceptual and Motor Skills, 49,* 359-365.

Mills, K., Munroe, K., & Hall, C. (2000). The relationship between imagery and self-efficacy in competitive athletes. *Imagination, Cognition and Personality, 22,* 33-39.

Moritz, S., Hall, C., Martin, K., & Vadocz, E. (1996). What are confident athletes imaging?: An examination of image content. *The Sport Psychologist, 10,* 171-179.

Munroe, K.J., Giacobbi, P.R., Hall, C.R., & Weinberg, R. (2000). The four Ws of imagery use: Where, when, why, and what. *The Sport Psychologist, 14,* 119-137.

Munroe, K., Hall, C.R, Simms, S., & Weinberg, R. (1998). The influence of type of sport and time of season on athletes' use of imagery. *The Sport Psychologist, 12,* 440-449.

Munroe-Chandler, K.J., Hall, C.R., & Weinberg, R.S. (2004). A qualitative analysis of the types of goals athletes set in training and competition. *Journal of Sport Behaviour, 27,* 58-74.

Murphy, S.M. (1994). Imagery interventions in sport. *Medicine and Sciences in Sport and Exercise, 264,* 486-494.

National Coaching Certification Program, Coaching Theory Level 3. (1994). Gloucester, ON: Coaching Association of Canada.

Nunnally, J.C. (1978). *Psychometric theory* (2nd ed.). New York: McGraw-Hill.

Orlick, T. (1990). *In Pursuit of excellence* (2nd ed.). Champaigne, IL: Human Kinetics.

Paivio, A. (1985). Cognitive and motivational functions of imagery in human performance. *Canadian Journal of Applied Sport Sciences, 10*, 22S-28S.

Rodgers, W., Hall, C., & Buckolz, E. (1991). The effect of an imagery training program on imagery ability, imagery use, and figure skating performance. *Journal of Applied Sport Psychology, 3*, 109-125.

Rushall, B.S. (1988). Covert modeling as a procedure for altering an elite athlete's psychological state. *The Sport Psychologist, 2*, 131-140.

Salmon, J., Hall, C., & Haslam, I. (1994). The use of imagery by soccer players. *Journal of Applied Sport Psychology, 6*, 116-133.

Sordoni, C., Hall, C., & Forwell, L. (2000). The use of imagery by athletes during injury rehabilitation. *Journal of Sport Rehabilitation, 9*, 329-338.

Sordoni, C., Hall, C., & Forwell, L. (2002). The use of imagery in athletic injury rehabilitation and its relationship to self efficacy. *Physiotherapy Canada, Summer*, 177-184.

Start, K.B., & Richardson, A. (1964). Imagery and mental practice. *British Journal of Educational Psychology, 34*, 280-284.

Suinn, R.M. (1996). Imagery rehearsal: A tool for clinical practice. *Psychotherapy in Private Practice*, 15, 27-31.

Vadocz, E., Hall, C., & Moritz, S. (1997). The relationship between competitive anxiety and imagery use. *Journal of Applied Sport Psychology, 9*, 241-253.

Weinberg, R., Butt, J., & Knight, B. (2001). High school coaches' perceptions of the process of goal setting. *The Sport Psychologist, 15*, 20-47.

Weinberg, R., & Gould, D. (2003). *Foundations of sport and exercise psychology* (3rd ed.). Champaign, IL: Human Kinetics.

White, A., & Hardy, L. (1995). Use of different imagery perspectives on the learning and performance of different skills. *British Journal of Psychology, 86*, 169-180.

White, A., & Hardy, L. (1998). An in-depth analysis of the uses of imagery by high-level slalom canoeists and artistic gymnasts. *The Sport Psychologist, 12*, 387-403.

Appendix A

Coaches' Encouragement of Imagery Use by Athletes Questionnaire

COACHES' ENCOURAGEMENT OF IMAGERY USE BY ATHLETES QUESTIONNAIRE

PART A

Please fill in the blank or circle the appropriate answer:

Age: _____

Gender: Male / Female

Sport Coached: _____

Highest Level of Athlete(s) Presently Coaching: Recreational / Club / Provincial / Varsity / National / International

Number of Years Coaching at this Level: _____

Age of Athlete(s) Presently Coaching: _____

NCCP Level: _____(please leave blank if not applicable)

Does a Sport Psychology Consultant Work With Your Present Athlete(s):

Yes / No

Have You Personally Used Imagery as an Athlete: Yes / No

Mental imagery is an experience that imitates a real experience, and that we can be conscious of 'seeing' an image of smell, tastes, or sounds without actually experiencing the real thing (White & Hardy, 1998). This questionnaire was designed to assess the extent to which you encourage your athletes to use imagery. Please answer the questions with respect to the highest level of athlete(s) you are presently coaching or have coached in the past 12 months. Ratings will be made on a seven-point scale, where **1** represents that you **rarely** encourage your present athletes to use imagery and **7** represents that you **often** encourage your present athletes to use imagery. Statements that fall between these two extremes should be rated accordingly along the rest of the scale. Use the stem provided below to precede each of the statements then fill in the blank with the appropriate number from the scale provided to indicate the degree to which the statement applies to you. Remember, there are no right or wrong answers, so please answer as accurately as possible.

PART B

When in season, I encourage my athletes ...						
Rarely						Often
1	2	3	4	5	6	7

1. to use imagery in practice. _____
2. to use imagery outside of practice (e.g., at home). _____
3. to use imagery in conjunction with competition. _____
4. to use imagery when injured. ____
5. to use imagery post-competition._____
6. to use imagery just before competing. _____
7. to use imagery just before going to bed. _____

PART C

When in season, I encourage my athletes ...						
Rarely						Often
1	2	3	4	5	6	7

8. to make up new plans/strategies in their heads. _____
9. to image the atmosphere of winning a championship (e.g., the excitement that follows winning a championship). _____
10. to image giving 100%. _____
11. to consistently control the image of a physical skill. _____
12. to imagine the emotions they feel while doing their sport. _____
13. to imagine the excitement that follows winning an event. _____
14. to image alternative strategies in case their event/game plan fails. _____
15. to imagine handling the arousal and excitement associated with their sport. _____
16. to imagine appearing self-confident in front of their opponents. _____
17. to imagine other athletes congratulating them on a good performance. _____

18. to image each section of an event/game (e.g., offense vs. defence, fast vs. slow). _____
19. to imagine being in control in difficult situations. _____
20. to change an image of a skill when appropriate. _____
21. to image others applauding their performance. _____
22. to consistently perform a skill perfectly in their minds when imaging it. _____
23. to image winning a medal. _____
24. to imagine the stress and anxiety associated with their sport. _____
25. to image continuing with their game/event plan, even when performing poorly. _____
26. to feel themselves getting psyched up when imagining performing. _____
27. to mentally make corrections to physical skills. _____
28. to imagine executing entire plays/programs/sections just the way they want them to happen in an event/game. _____
29. to imagine performing a skill perfectly just before attempting it. _____
30. to imagine being mentally tough. _____
31. to feel relaxed when imagining themselves participating in their sport. _____
32. to imagine the excitement associated with performing. _____
33. to image being interviewed as a champion. _____
34. to image being focussed during a challenging situation. _____
35. to imagine performing a new skill perfectly when learning it. ____
36. to imagine successfully following their game/event plan. _____
37. to image working successfully through tough situations (e.g., a player short, sore ankle, etc.). _____

PART D

When in season, I encourage my athletes ...

Rarely						**Often**
1	**2**	**3**	**4**	**5**	**6**	**7**

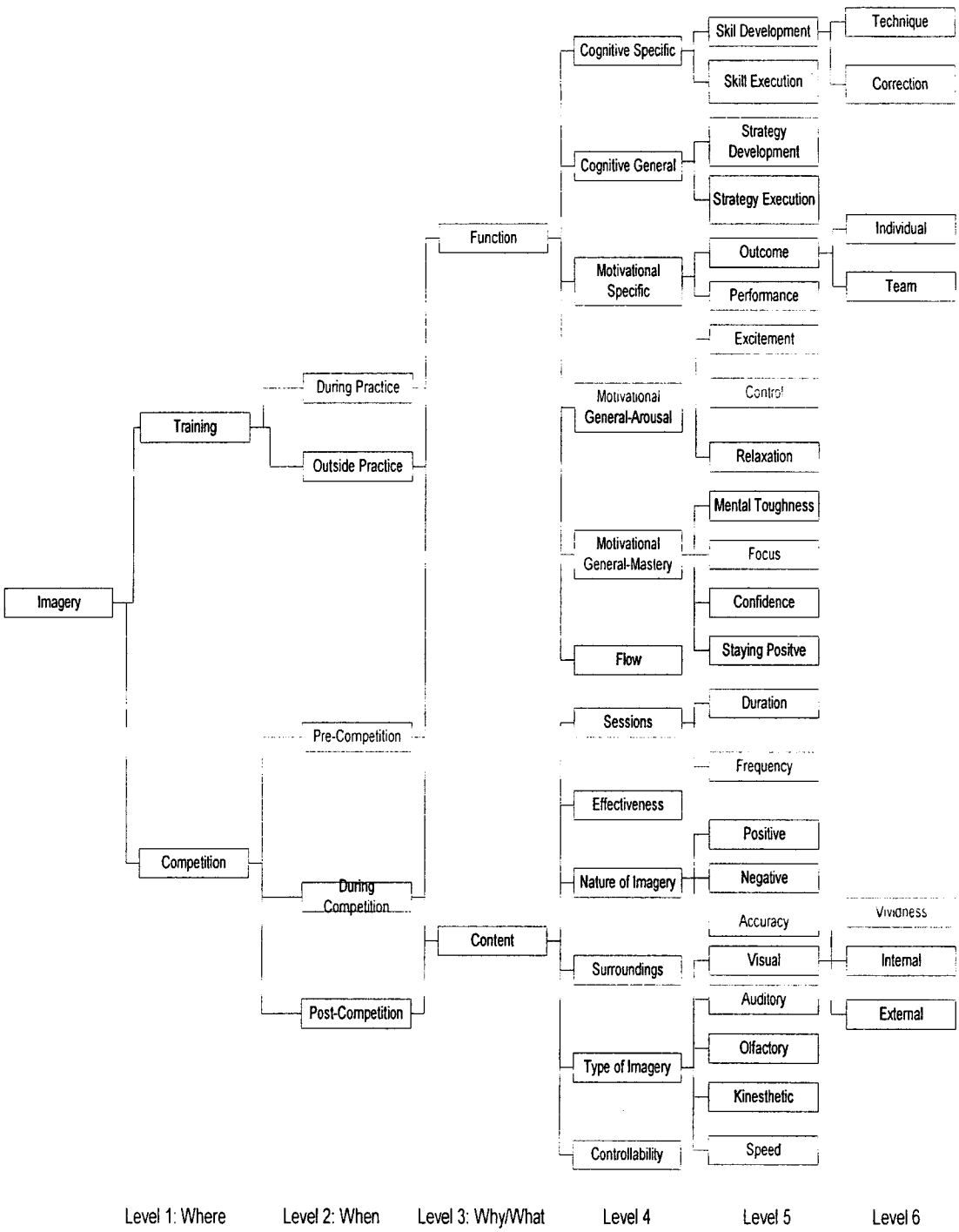
38. to image using an external perspective (i.e., seeing themselves from outside of their body as if watching a video of themselves). _____

39. to image using an internal perspective (i.e., seeing what they would see if they were actually performing). _____
40. to use visual imagery (seeing the image in one's mind). _____
41. to use kinesthetic imagery (i.e., imagining the feel of movements). _____
42. to make their images as accurate as possible. _____
43. to make their images as vivid as possible. _____
44. to do their imagery in real time. _____
45. to plan their imagery session (e.g., plan what they are going to image and for how long). _____
46. to use imagery on a regular basis. _____
47. to use auditory imagery (e.g. hear the crowd). _____

Appendix B

4 W's of Imagery Use

(Munroe et al. 2000)



Appendix C

Letter of Information

UNIVERSITY OF
WINDSOR

Letter of Information

Coaches Encouragement of Imagery Use

You are being asked to participate in a research study conducted by Nathan Hall and Dr. Krista Chandler, from the Faculty of Human Kinetics at the University of Windsor. The results of this study will contribute to the completion of a Masters Thesis in sport psychology.

If you have any questions or concerns about the research, please feel free to contact Dr. Krista Munroe-Chandler at (519) 253-3000 x. 2446 chandler@uwindsor.ca.

Purpose of the Study
The purpose of the study is to investigate the influence coaches have on their athletes' use of mental imagery. Imagery is defined as creating or recreating experiences in one's mind. Coaches can encourage the use of mental imagery by their athletes as a means to practice a skill or a game plan, controlling emotions, maintaining confidence, and setting goals such as winning.

Procedures
If you volunteer to participate in this study, we would ask you to do the following:

You will be asked to complete the Coaches Encouragement of Imagery Use by Athletes Questionnaire (CEIUAQ). The questionnaire is composed of four sections that combine for a total of 47 items. The questionnaire asks you where, when, and why you encourage your athletes to use imagery, and what you encourage them to image. Each item is rated on a 7-point scale where 1 = rarely and 7 = often. The questionnaire will require 10-15 minutes of your time.

Potential Risks and Discomforts
There are no known or anticipated risks from discussing the influence you as a coach have on your current athletes' use of mental imagery.

Potential Benefits to subjects and/or to Society
The researchers will gather valuable knowledge on how coaches influence their athletes' use of mental imagery. The findings will be used to compare differences between athletes' and coaches' perceptions on exactly how coaches are influencing their athletes' imagery use. The study may stimulate coaches' interests in the benefits of promoting imagery use to their athletes and give them ideas of areas of imagery encouragement that they may not have considered. Furthermore, the results from the study will indicate areas of mental imagery encouragement by coaches that could be improved upon, thereby enhancing the sport performance of their athletes.

Payment for Participation
Subjects will not be compensated for their involvement in the project.

Confidentiality
Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission. All completed questionnaires will be kept in strict confidence. The information collected from the study will be used for the purpose of the present research and the communication of the results. Potentially the information may also be utilized in subsequent studies conducted by the researchers. All completed questionnaires will be kept in the secure office of the primary investigator. The questionnaires will be destroyed after 3 years.

Participation and Withdrawal
Participation in this study is voluntary. You can choose whether to be in this study or not. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind. You may also refuse to answer any questions you do not want to answer and still remain in the study. Furthermore, you can also utilize the option of removing your data from the study at any time. The investigator may withdraw you from this research if circumstances arise which warrant doing so.

Feedback of the Results of this Study to the Subjects
The investigators will provide feedback to you upon request. If you have any additional concerns or questions you can email or call the investigator at the telephone number above. Please keep this letter of information.

Rights of Subjects
This study has been reviewed and received ethics clearance through the University of Windsor Research Ethics Board. If you have questions regarding your rights as a research subject, contact:

Research Ethics Co-ordinator
University of Windsor
Windsor, Ontario
N9B 3P4

Telephone: 519-253-3000, # 3916
Email: lbunn@uwindsor.ca

SIGNATURE OF INVESTIGATOR

These are the terms under which I will conduct research.

_____ _____
Signature of Investigator Date

Appendix D

Consent Form

UNIVERSITY OF
WINDSOR

Consent to Participate in Research

Coaches Encouragement of Imagery Use

You are being asked to participate in a research study conducted by Nathan Hall and Dr. Krista Chandler, from the Faculty of Human Kinetics at the University of Windsor. The results of this study will contribute to the completion of a Masters Thesis in sport psychology.

If you have any questions or concerns about the research, please feel free to contact Dr. Krista Munroe-Chandler at (519) 253-3000 x. 2446 chandler@uwindsor.ca.

Purpose of the Study
The purpose of the study is to investigate the influence coaches have on their athletes' use of mental imagery. Imagery is defined as creating or recreating experiences in one's mind. Coaches can encourage the use of mental imagery by their athletes as a means to practice a skill or a game plan, controlling emotions, maintaining confidence, and setting goals such as winning.

Procedures
If you volunteer to participate in this study, we would ask you to do the following:

You will be asked to complete the Coaches Encouragement of Imagery Use by Athletes Questionnaire (CEIUAQ). The questionnaire is composed of four sections that combine for a total of 47 items. The questionnaire asks you where, when, and why you encourage your athletes to use imagery, and what you encourage them to image. Each item is rated on a 7-point scale where 1 = rarely and 7 = often. The questionnaire will require 10-15 minutes of your time.

Potential Risks and Discomforts
There are no known or anticipated risks from discussing the influence you as a coach have on your current athletes' use of mental imagery.

Potential Benefits to subjects and/or to Society
The researchers will gather valuable knowledge on how coaches influence their athletes' use of mental imagery. The findings will be used to compare differences between athletes' and coaches' perceptions on exactly how coaches are influencing their athletes' imagery use. The study may stimulate coaches' interests in the benefits of promoting imagery use to their athletes and give them ideas of areas of imagery encouragement that they may not have considered. Furthermore, the results from the study will indicate areas of mental imagery encouragement by coaches that could be improved upon, thereby enhancing the sport performance of their athletes.

Payment for Participation
Subjects will not be compensated for their involvement in the project.

Confidentiality
Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission. All completed questionnaires will be kept in strict confidence. The information collected from the study will be used for the purpose of the present research and the communication of the results. Potentially the information may also be utilized in subsequent studies conducted by the researchers. All completed questionnaires will be kept in the secure office of the primary investigator. The questionnaires will be destroyed after 3 years.

Participation and Withdrawal
Participation in this study is voluntary. You can choose whether to be in this study or not. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind. You may also refuse to answer any questions you do not want to answer and still remain in the study. Furthermore, you can also utilize the option of removing your data from the study at any time. The investigator may withdraw you from this research if circumstances arise which warrant doing so.

Feedback of the Results of this Study to the Subjects
The investigators will provide feedback to you upon request. If you have any additional concerns or questions you can email or call the investigator at the telephone number above. Please keep this letter of information.

Rights of Subjects
This study has been reviewed and received ethics clearance through the University of Windsor Research Ethics Board. If you have questions regarding your rights as a research subject, contact:

Research Ethics Co-ordinator
University of Windsor

Telephone: 519-253-3000, # 3916
Email: lbunn@uwindsor.ca

Windsor, Ontario
N9B 3P4

SIGNATURE OF RESEARCH SUBJECT/LEGAL REPRESENTATIVE

I understand the information provided for the study **Coaches' Encouragement of Imagery Use** as described herein. My questions have been answered to my satisfaction, and I agree to participate in this study. I have been given a copy of this form.

_____
Name of Subject

_____ _____
Signature of Subject Date

SIGNATURE OF INVESTIGATOR

These are the terms under which I will conduct research.

_____ _____
Signature of Investigator Date

VITA AUCTORIS

NAME:	Nathan D. Hall
PLACE OF BIRTH:	London, Ontario
YEAR OF BIRTH:	1980
EDUCATION:	Oakridge High School, London 1994-1999
	University of Western Ontario, London, Ontario 1999-2003 Honors B.A.
	University of Windsor, Windsor, Ontario 2003-2005 M.A.
ACADEMIC PRESENTATIONS:	ECSEPS, St. Catherines, Ontario 2004